Dental Digest

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FOUR-APPOINTMENT *Procedure*

for Complete Dentures

J. R. CARLTON, D.D.S., Chicago

DIGEST

There is probably a wider variety in prosthetic theories and techniques than in any other branch of dentistry. This article presents a practical method of denture construction used successfully in dental offices for a number of years. Its inception can be traced to the studies of G. V. Black, the research and developments of Gysi, Hanau, and Hall.

Procedures Included in Technique

Four appointments are required to complete the following procedures for a finished case:

1. Securing of nonpressure impressions of tissue at rest.
2. Recording of positive centric relationship.
3. The development of a denture outline to follow the junction of moving and nonmoving tissue.
4. Establishment of vertical dimension.
5. Selection and arrangement of teeth to allow for lateral movement without cuspal interference on a flat plane of occlusion.

First Appointment— Preliminary Impressions

Primary impressions are taken for the sole purpose of building well-fitting individual trays for final impressions. It is important that the metal tray will include the areas desired and be trimmed and shaped to an approximate fit. A low fusing compound is used with the lightest finger pressure when the impressions are taken.

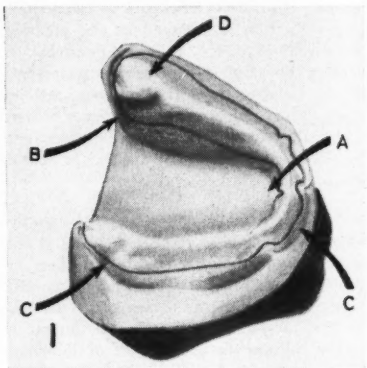
The following regions are included in the primary impressions:

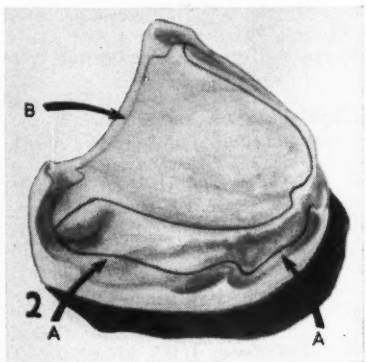
Upper Impression — The entire stress-bearing area is included, terminating at the buccal and labial fold. Posterior termination is approximately 4 millimeters distal to a straight line from one hamular notch to the other. The only movement that will be made by the patient on the impression tray with the compound in position will be to open, close, and make lateral movements of the mandible to mold the compound on the distal-buccal area over the tuberosities and distal-buccal angle to the hamular notch.

Lower Impression—The labial and buccal area to the fold is included in the lower impression. Posteriorly the impression includes all the retromolar pads. Lingually the depth of the lingual fossae, continuing at the same depth to a point at least 4 millimeters below the pad is included. The protrusion of the tongue determines the depth of the lingual fossae which is the only movement made by the patient when the lower tray with compound is being placed in position (Figs. 1 and 2). Custom-built final trays and a primary bite are constructed by the technician.

Second Appointment— Final Impressions

Nonpressure impressions are made with processed plaster in custom-built trays. With a properly designed tray no difficulty should be encountered. A good final impression includes all the denture-bearing areas with accurate detail without impingement by the tray on the soft tissues. The impression border will present a rather thin roll. A nonpressure impression procedure is taken in order to avoid tissue distortion.





1. ***The outline of the lower tray: (A) the lingual fossae, (B) extension below the internal oblique line and the retromolar pad, (C) the mucolabial and mucobuccal folds, and (D) the entire retromolar pad.***

2. ***The outline of the upper tray: (A) the buccal and labial folds, and (B) extension 3 millimeters back of a straight line between the hamular notches.***

Outline of Upper and Lower of Importance—On the upper, the junction of the moving and nonmoving tissue establishes the basic outline of the border of the denture. The lower outline is designed to the junction of the moving and nonmoving tissue.

Retentive Factors—The stability of a denture base depends on the stress-bearing and retentive areas. The harder areas of the ridge and the palate are stress-bearing areas. Between the termination of the ridge and the mucobuccal fold of each jaw is a certain amount of resilient tissue which has retentive possibilities. The retromolar pad represents another resilient potential for retention. Dentures outlined in this way will possess maximum stability and retention (Fig. 4).

Primary Centric—This is established by the use of a soft roll of wax placed on the primary bite constructed at the time the trays are made. This is used for inital mounting of casts on the articulator to enable the technician to construct tracing plates on stabilized baseplates as well as to study the anterior teeth.

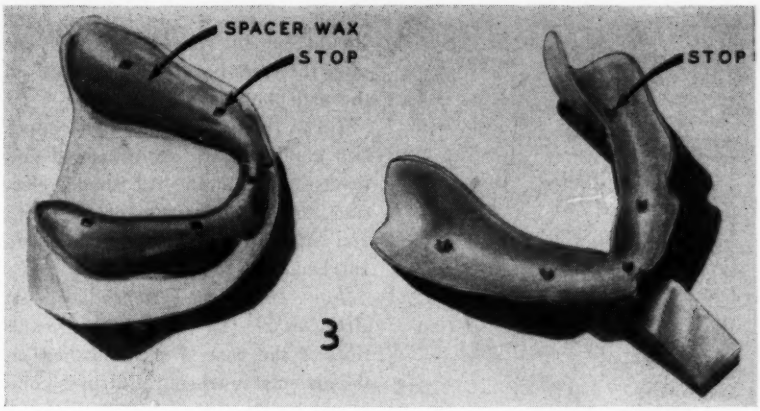
Tooth Color Selected—During the second appointment, the proper tooth shade is selected. The patient's coloring, sex, age, personality, and complexion must be taken into consideration when choosing tooth color.

Third Appointment—Centric Relation

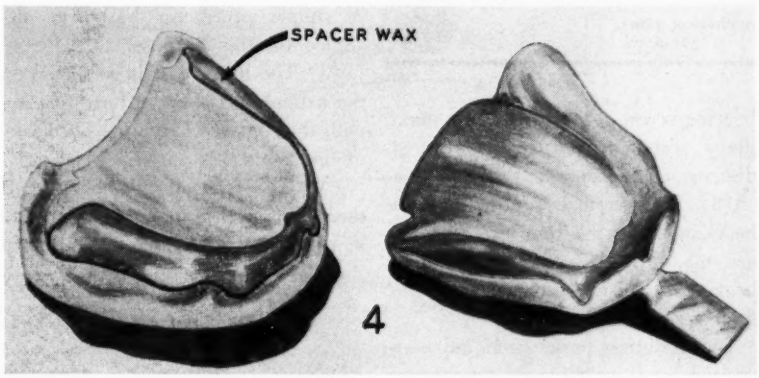
A centric registration is obtained by means of an intraoral tracing device mounted accurately on stabilized occlusion rims. The patient always returns to centric relation (the most retruded position of the condyles in the glenoid fossae from which lateral mandibular movements may be made) at the conclusion of a masticatory stroke. This relation must be recorded accurately in order to secure the maximum of comfort and efficiency in mastication for the patient.

Establishment of Flat Plane—(1) The tracing device is mounted on stabilized occlusion rims.

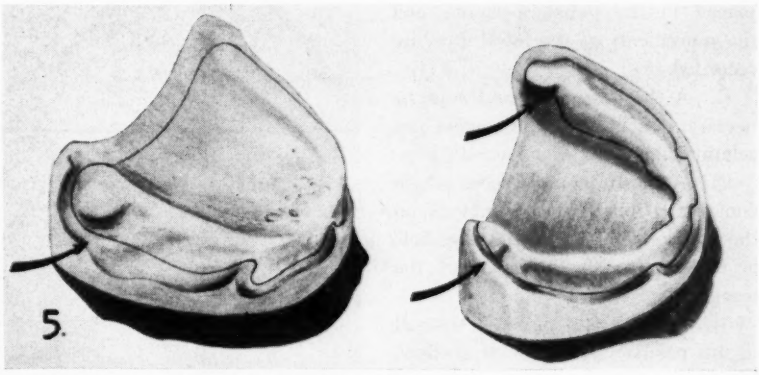
(2) The stabilized occlusion rims are constructed on the cast made from the final impressions with a flat plane of occlusion.



3. ***Left, spacer wax on the primary lower cast. Right, stops in the acrylic resin tray.***



4. ***Spacer wax is carried to the crest of the ridge on the primary upper cast. The upper acrylic resin tray is not relieved in the palatal region.***

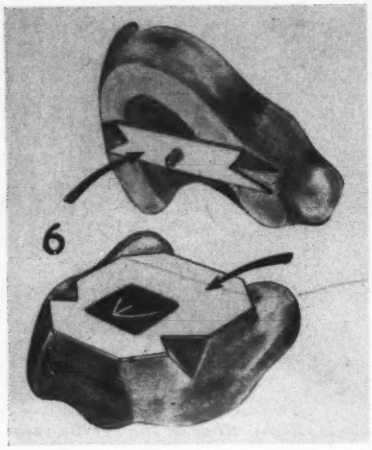


5. ***The upper and lower denture outlines on the final casts.***

(3) The flat plane is established by the incisal edge of the lower anterior teeth anteriorly and by the height of the retromolar pads posteriorly. This height in turn is determined by the arbitrary centric which was established previously.

Alteration of Vertical Dimension—(1) The dimensions in millimeters are accepted from the labial fold close to the labial frenum, to the incisal edge of the lower anterior teeth.

(2) A metal plate is mounted on the lower occlusal rim and a central



6. ***The intraoral tracing device attached to the stabilized baseplates and occlusion rims.***

bearing screw is attached to the maxillary occlusion rim at the vertical dimensions registered.

(3) The vertical dimensions can be changed at the time the tracings are made by adjusting the central bearing screw or at the time of the final try-in.

(4) Relining paste or liquid wax is used for stabilizing the baseplates.

Jaw Relationship Recorded—(1) The stabilized baseplates with the intraoral tracing device attached are placed in the patient's mouth and the movements of the lower jaw are recorded.

(2) A sharp apex of the tracing is necessary to indicate the correct jaw relationship.

(3) A plastic control piece which contains a small hole is placed on the lower metal plate and the hole is lined up with the apex of the tracing.

(4) The control piece is secured in this position by means of a screw. The central bearing screw should slip into the hole of the control piece.

Use of Plaster Locks—The correct relationship between the upper and lower occlusion rims is maintained by plaster locks. It is important that the plaster locks are accurate, since the success of the upper and lower dentures will depend to a considerable degree upon the proper jaw relationship. Therefore, a second set of plaster locks are prepared. They should be interchangeable for use after the casts have been mounted on the articulator.

Teeth Tried in Mouth—The upper and anterior teeth are arranged and tried in the mouth. The shade selection and arrangements of the teeth and the vertical dimensions are checked.

Jaw Movements Reproduced in Articulator—(1) The final orientation of the cast is accomplished on the articulator which, in turn, is completed by the technician.

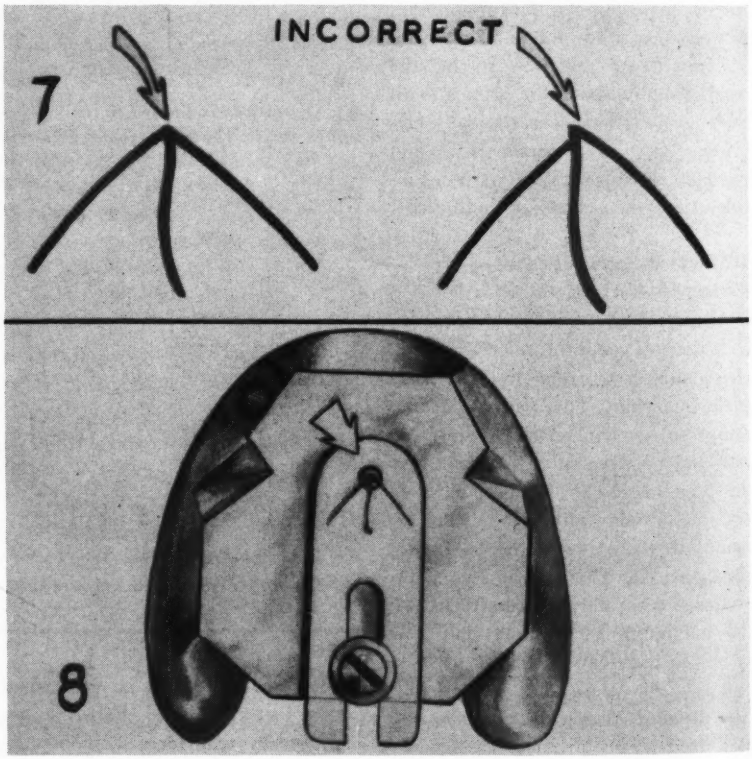
(2) The intraoral tracing produced by the jaw movements of the patient are reproduced on the articulator. A simple protractor has been designed for this purpose.

(3) The lower cast is relocated on the articulator in the proper relation with the centers of rotation by means of the tracing.

(4) The relation of the apex of the Gothic arch tracing to the centers of rotation is determined by measuring the angle of the tracing and relating this measurement to the articulator.

Orientation of Lower Cast — An articulator with a lower base that can be moved anteriorly and posteriorly as well as laterally is used for the orientation of the lower cast. The proper height of the lower cast was established when the casts were mounted previously. After final orientation of the lower cast, the upper cast is remounted by means of the stabilized baseplates, and the intraoral tracing devices, which are held in the correct relationship by the plaster locks, are used.

Teeth That Will Function on Flat Plane Selected—The lower posterior teeth are set up on a flat plane of occlusion. The registration of the Gothic arch tracing on a flat plane indicates that the mandible is able to move on a flat plane. The selection of teeth that will function on a flat plane is important. It has been observed that the movement of the



7. ***Left, a correct tracing. Right, an incorrect tracing.***

8. ***The hole in a plastic control piece is locked exactly over the apex of a perfect tracing.***

mandible is governed by the occlusal surfaces of the posterior teeth. The articulator used has flat condylar and incisal guidance inclination which are parallel with the flat plane of occlusion.

Cuspal Interference Avoided—In arranging the teeth, close attention is paid to balanced occlusion of the posterior teeth and a natural arrangement of the anterior teeth. The posterior teeth are set so there is no cuspal interference when lateral movements of the articulator are made.

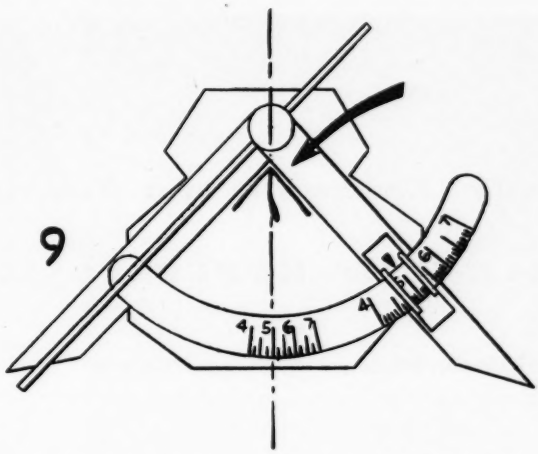
Denture Remounted on Articulator — After the dentures are processed, they are remounted on the articulator to make sure that no processing error has occurred. Spot grinding may be necessary to obtain a satisfactory final balance of the dentures on the articulator.

Fourth Appointment— Insertion of Dentures

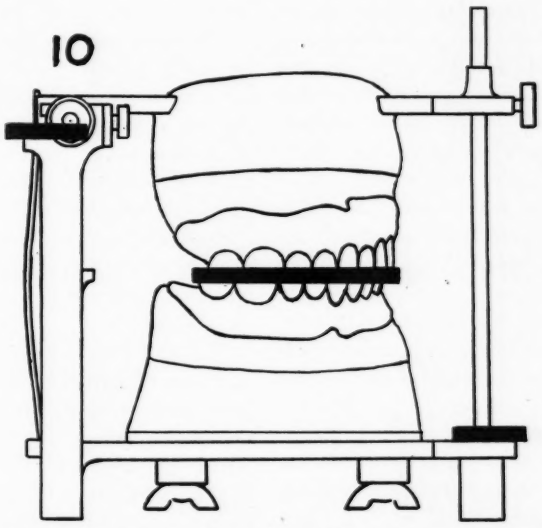
Adjustments—If all the steps described have been carefully followed, no adjustments are necessary when the dentures are placed in the patient's mouth. Centric relation should never be corrected at the time the dentures are delivered to the patient. The patient may have had dentures with an incorrect centric relation for a long time and it will therefore take a day or more for him to become accustomed to the correct jaw relationship.

Esthetics Important—If correct impressions were made and the proper jaw relationship was established, the dentures will be most satisfactory as far as stability, retention, and function are concerned. The importance of esthetics, however, should never be underestimated. The patient is interested as much, or possibly more, in attractive as in proper functioning dentures.

Northwestern University Dental School



9. ***A protractor is used to relate the casts to the articulator with the included angle of the tracing as the reference point.***



10. ***An articulator with flat incisal and condylar guidances is used. These guidances and the occlusal plane are parallel to the base of the instrument.***

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A Clinical Evaluation of a New Agent for the Relief of HYPERSENSITIVE DENTINE

GERALD FITZGERALD, D.D.S., Lathrup Village, Michigan

DIGEST

Causes of hypersensitivity are various, including faulty occlusion, overhanging restorations, improperly fitted appliances, and incorrect or excessive brushing amounting to fanatical cleanliness. Teeth adjacent to unrestored empty spaces are prime targets for sensitivity. Formulae for office use have received the major attention in this search for a method to ensure relief for these areas, but they have proved inadequate since the treatments can seldom be regular enough to maintain comfort.

The ideal solution to the problem of hypersensitivity would be a preparation that could be used in the normal activities of good home hygiene as a supplement to office care. The purpose of this article is to discuss such a preparation and to offer some observations which will indicate its effectiveness.

Resumé of Treatment Methods Employed

There are many published references to the problem of hypersensitivity and its treatment. Topically applied salts in this condition have been used from the days of Andresen[1] to the present common practice of applying silver nitrate or sodium fluoride to sensitive areas. As Smith[2] has pointed out:

"Whether remineralization of the enamel is possible is a disputed point, but the fact remains that, through the use of a 'remineralizing powder,' it seemed to be possible to make tooth surface lesions more resistant and less sensitive."

Regardless of their theoretic basis, the empiric usefulness of salts in decreasing hypersensitivity seems well established.

Use of Formaldehyde — Various solutions of formaldehyde have long been used to treat hypersensitivity. Grossman[3] calls solution of formaldehyde the medicament of choice for exposed surfaces of anterior teeth or when a nonstaining agent is desired. More recently, Blass[4] has recommended the inclusion of paraformaldehyde in a desensitizing dentifrice, pointing out that it "reduces cementum sensitiveness by precipitating protein in the dentinal tubules to prevent pain impulses from being carried to the pulp."

New Agent Available—Based on many years of successful office use of salts and formaldehyde in overcoming hypersensitivity, a dentifrice, Thermodent®, combining a high content of sodium, potassium, calcium, and magnesium salts, and a 1.4 per cent concentration of formalin has recently been made available.

General Considerations

The intelligent use of this agent in the treatment of hypersensitivity begins with a thorough prophylaxis and an adequate diagnosis, with particular attention to the cause of the condition. For purposes of study, however, use of this agent was instituted in eleven cases before any corrective measures were taken against the causative factors. In these cases Thermodent proved sufficiently effective to keep the patients comfortable even though the condition of hypersensitivity was still in a progressive state.

First Step in Procedure—In routine office use, however, the usual methods of scaling and polishing the teeth should be the first step in the procedure. A special degree of care should be exercised during this instrumentation and polishing to avoid overheating the tooth with revolving equipment.

Succeeding Steps—(1) The normal prophylactic attention should be followed by the removal of any overhanging restorations. (2) Balancing of the articulation of any teeth demonstrating traumatic occlusion. (3) Removal of any other cause that may predispose the tooth to the loss of its protective normal gingival attachment. (4) Instruction in proper brushing technique.

Long Range Plans—These should include (1) the correction of malocclusion through the use of orthodontic treatment, bite raising appliances, or other devices, and (2) the restoration of missing teeth to prevent the sensitivity common to teeth next to unrestored spaces.

Desensitizer may be Used—As an optional procedure, one of the many desensitizers recommended for office use may be applied after the prophylaxis.

[1]Andresen, V.: The Physiological and Artificial Mineralization of the Enamel, Oslo, Norway, Statens Tandlaegeinstitut, 1923.
[2]Smith, C. A. H.: Hard Tissue Lesions of the Mouth, JADA **33**:214 (Feb.) 1946.
[3]Grossman, I. I.: The Treatment of Hypersensitive Dentin, JADA **21**:2050 (Nov.) 1934.
[4]Blass, J. L.: Prescription Aids in Dental Practice, New York Univ. J. Dent. **8**:113 (Jan.) 1950.

Clinical Evaluation

This evaluation was undertaken by the writer after its effectiveness was proved by personal use. For twenty years I have had five areas that have not adequately responded to the available treatments and have been constantly on the watch for anything that held promise. It was natural, therefore, that Thermodent was tried as soon as it became available.

Immediate Relief — Use of this agent resulted in relief at the outset. Because of the personal problem, particular cognizance has been taken of the same problem in others and it was a simple matter to prescribe Thermodent to three severe cases encountered. The results in these three cases, all more severe than the writer's prompted a more extensive and regulated examination of this product. Since instituting the study eighty-nine cases, in addition to the three mentioned above, have been observed.

Records Prepared—For each case a separate chart was prepared on which was recorded the patient's history, state of mouth hygiene, condition of soft tissues, and the degree, duration, and area of hypersensitivity. In addition, any deviations from normal occlusion were recorded because of their apparent correlation with the incidence of hypersensitivity.

Series Reported—All but two of the 92 patients included in the study had suffered from hypersensitivity for at least one year. The characteristics of this series are presented in Table I.

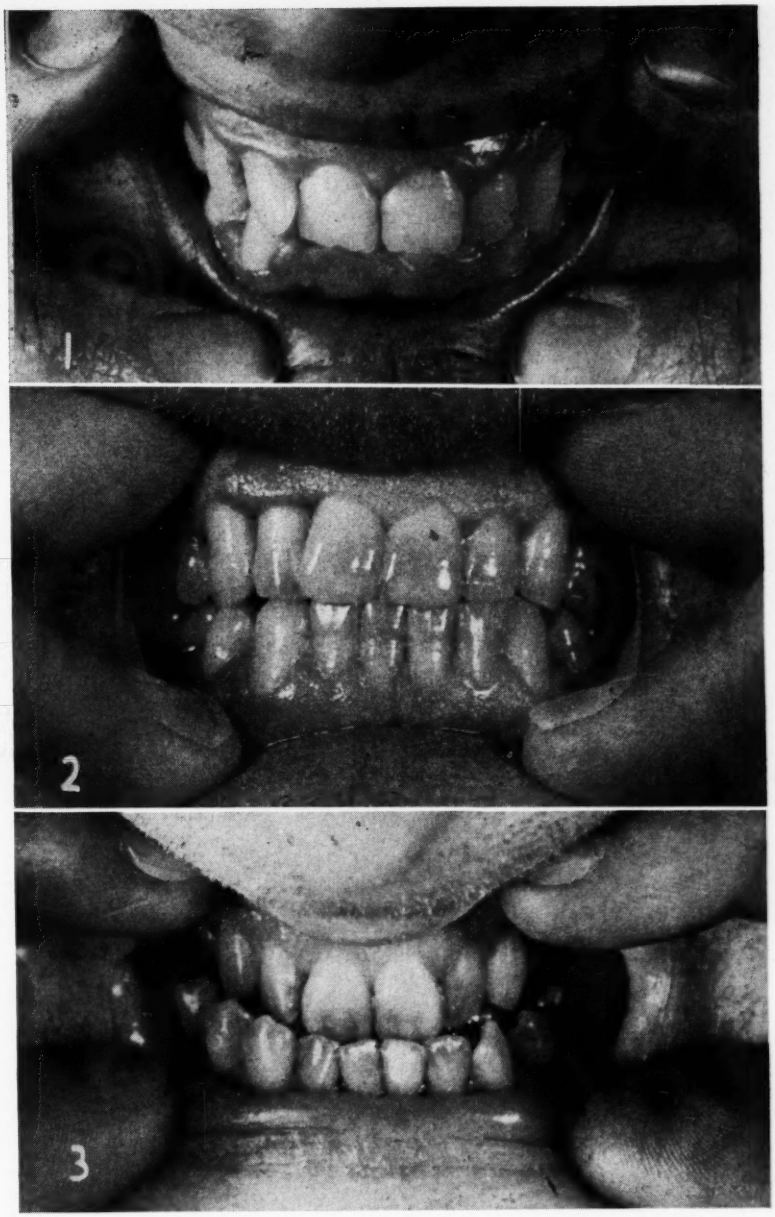
TABLE I

Characteristics of Series

Number of patients studied	92
Average duration of hypersensitivity	4.6 years
Number with malocclusion	40 (43%)
Number with soft tissue pathology	37 (41%)

Observation of Results—After following the general procedures outlined, each patient was placed on this preparation and periodic, successive appointments were made in order to observe and record the degree of improvement, if any. A total of 571 patient visits was recorded during the 13 months of the study, or an average of 6.2 observations per patient.

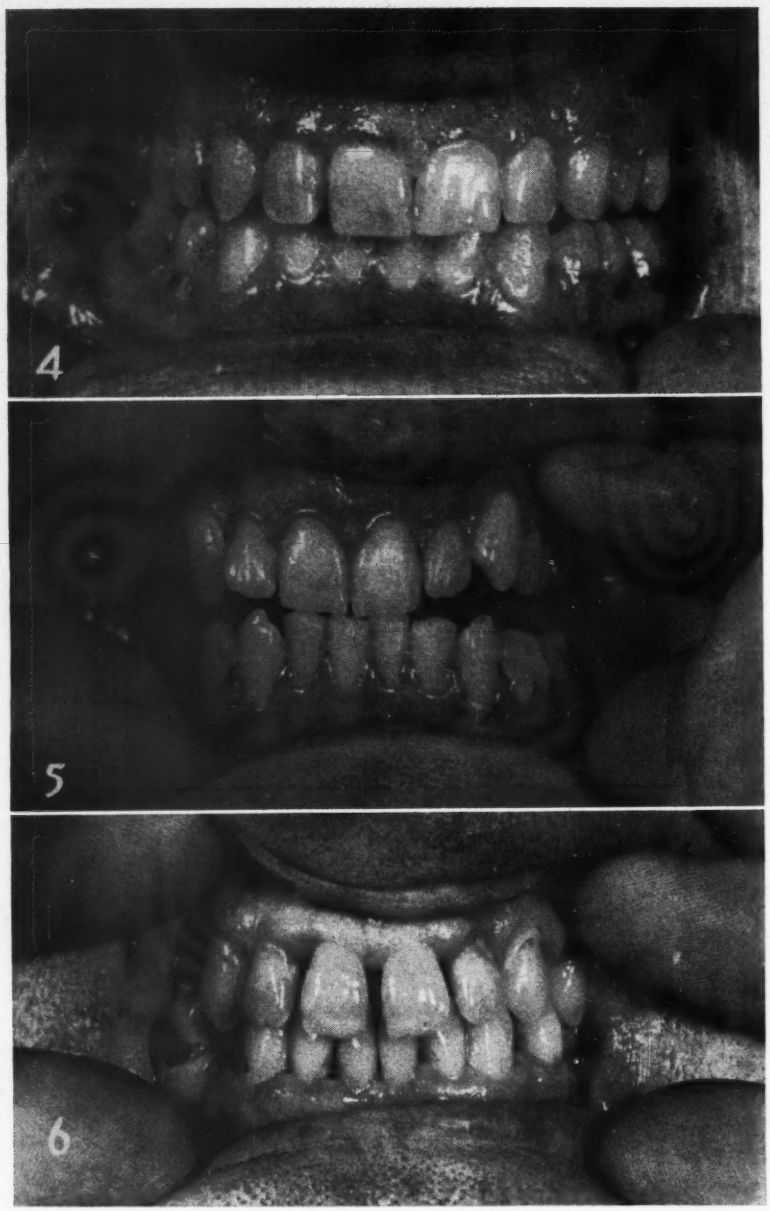
Degree of Relief Evaluated—It is difficult to measure the degree of relief obtained in arbitrary numerical terms. An attempt was made, however, to evaluate this factor with the



1. ***The excessive closure of the bite shown here results in hypersensitivity of the labial surfaces of the lower anterior teeth and the lingual surfaces of the upper teeth. Although Thermodent proved effective in providing relief in this case its desensitizing action was speeded with the insertion of a bite-raising appliance.***

2. ***Traumatic occlusion produces symptoms throughout the dental arch that are prime factors in producing hypersensitivity. Although the desensitizing agent will give temporary relief in these cases, the correct treatment would include the relief of this causative factor.***

3. ***Because of the elongation of the unopposed teeth the Class III malocclusion is a fertile field for hypersensitivity. The desensitizing agent proved especially effective in providing relief for these cases.***



4. ***Inadequate brushing in the gingival area is a common predisposing factor in the development of hypersensitivity. A profitable by-product of the prescription of the desensitizer is the improvement in the hygiene in this type of case.***

5. ***Excessive scrubbing has produced recession of the gingiva of the upper central teeth with resulting hypersensitivity. Although the desensitizer is highly effective here relief is hastened by correction of the brushing habits.***

6. ***Unrestored, missing teeth have caused a drifting of the remaining teeth with the resultant breakdown of the gingival attachment and subsequent hypersensitivity. The desensitizing agent is effective in these cases because of its ability to seek out the exposed areas and, by continued use, cope with the inevitable successive changes.***

aid of the patient's subjective responses modified by the author's observations of how well the patient was able to tolerate such external stimuli as cold air, scaling, and polishing before and after treatment. The effectiveness of the regimen is reported in Table II.

TABLE II

Degree of Relief with Thermodent

	No.	Per Cent
Complete relief (100%)	39	42%
Good relief (70% - 90%)	28	30%
Fair relief (40% - 60%)	17	19%
Little relief (10% - 30%)	8	9%
	92	100%

Reactions Reported — All patients in this series reported at least some benefit. One patient appeared to exhibit a reaction in the form of redness and irritation at the gingival margin which disappeared upon discontinuing the use of the agent, but this was not considered to be serious.

Observations

During the course of this study many interesting observations were made. The most spectacular was the case of a young woman with a pronounced Class III malocclusion who experienced extreme discomfort in cold weather particularly in the lower anterior region. In five days she experienced noticeable relief; in thirty days she was able to walk in the cold without covering her mouth with a handkerchief and in three months she considered her relief complete although one tooth responded definitely to a blast of cold air from a syringe.

Control Experiment Attempted — Three other cases involving highly cooperative patients were selected to demonstrate the effectiveness of this densensitizer on one side of the mouth while the other side received no treatment other than the use of the regular dentifrice. It must be stressed that the writer is well aware that attempting an evaluation of this type between different sides of the same mouth is open to much criticism but is offered here for what it is worth. Relief was definite after fourteen days; the original reaction to cold air being severe while at the end of the two-week period there was only a mild reaction to this stimulus on the treated side. The opposite side continued to exhibit a severe reaction.

Saliva Tests made—On six patients saliva tests to determine the number

of lactobacilli present were made. All of these cases demonstrated severe or extremely severe reactions at the first examination. Three of these were treated with Thermodent only while the other three followed the dietary directions of the Michigan State Department of Health.

Effect of Prescribed Diet—Because of a time delay in securing the results of the tests from the Department of Health the desensitizer-only users had approximately two weeks of treatment before the dietary instructions were available. As the prescribed diet is followed the acid balance of the mouth changes perceptibly and quickly. As the acid balance of the mouth tends to become normal the action of the agent is further improved so that, in comparing the cases, the ones on the corrective diet seem to show greater progress at the thirty-day period after having run on an almost even keel for the first two weeks.

Reduction in Lactobacillus Count of Value—At the end of sixty days all six cases were recorded as negative to hypersensitivity but two of the diet corrections had reached this stage a few days earlier than the desensitizer-only users. In practice, therefore, if a high lactobacillus count is suspected and a service such as Michigan offers is available, it would be definitely to the patient's benefit to make such a test. From the observation of the above six cases it would seem that the result would eventuate the same, but would be reached more quickly with dietary reduction in the lactobacillus count.

Localized Hypersensitivity Studied—In the course of the study eleven cases of localized hypersensitivity were observed for a period of six weeks. Five cases were treated with a popular desensitizer considered safe for routine office use. The other six used Thermodent exclusively. All received the usual prophylactic care with removal of as many short range causative factors as could be done at one sitting. One of the office-treated cases had no recurrence of hypersensitivity during the period; the others had relief lasting from four to fourteen days.

Suggested Continuation of Treatment in Chronic Cases—The six cases using the desensitizer showed little relief during the first fourteen days but enjoyed continued relief thereafter. Three of these cases discontinued Thermodent at the end of the six-week period and remained symptom free for varying periods of two to eight weeks. Upon returning to the use of Thermodent, they were all free of sensitivity again after several days' use and relief seemed to be more quickly obtained than when the agent was first prescribed. This suggests the desirability of continuing chronically hypersensitive patients on the agent in order to maintain reduced sensitivity.

Ideal Dental Patients—Three cases which the writer has had under observation for more than fifteen years prior to the introduction of Thermodent present an interesting phenomenon! (1) All of these patients have a tendency toward excessive calculus formation; (2) all three are heavy smokers; (3) all are relatively caries free; (4) all have well-formed teeth with normal occlusion, adequate and early replacement of missing teeth; (5) all exhibit good hygiene and an awareness of the need for regular professional care. These patients are, in short, near the ideal as dental patients.

An Aid in Prophylaxis Techniques—The regular prophylaxis, in the patients described, has been somewhat of an ordeal for them unless some form of topical anesthesia has been used to assist the scaling and polishing. Prior to the institution of this study the three were put on Thermodent with the hopes that its use would help them over the first few post-prophylaxis days. It is now possible to scale and polish their teeth in reltive comfort without the aid of any topical anesthesia except in a few localized areas.

Summary

In view of its beneficial effect on his personal problem and the closely integrated study that has been made of this product in 92 carefully observed patients, the writer feels justified in enthusiasm about the future of this agent. It is felt that this is the first approach to adequate treatment for an ever-increasing problem in dentistry. Heretofore, in the writer's opinion, the treatment of hypersensitive areas has been considered unimportant.

Thermodent makes available for the first time a method of treating this common ailment which keeps the corrective agent in regular daily contact with the offending surfaces. An interesting by-product of the use of this agent is a greater awareness of dentistry with the resulting improvement in hygiene which occurred in nearly all cases under study.

27305 *Southfield Road*

The Oral Tissues and Nutrition[1]

CHANGES in oral tissues may be early indications of serious nutritional deficiencies. Among the changes which occur may be changes in the lips, in the color of the oral mucosa, and in the tongue coating. Although pronounced oral changes such as occur in acute scurvy may be readily recognized, the slight abnormalities of early vitamin B complex deficiency or diabetes mellitus may be overlooked.

Nutritional deficiencies in some older persons may be due to the selection of high carbohydrate diets because of poor dentures or poor mastication of food in the mouth. Artificial dentures do not assure adequate mastication of food. In fact, their efficiency is approximately only 25 per cent of that of normal teeth. Nutritional deficiencies may also prevent their proper functioning.

The general practitioner should strive to recognize and treat oral lesions which are early indications of nutritional deficiencies.

From The Scientific Literature, *Food and Nutrition News* **25**:4 (April) 1954.

[1]Burkett, L. W.: The Oral Tissues and Nutrition, J. Clin. Nutr. **1**:551, 1953.

A Clinical Investigation of MEPHATE®

in Dentistry—Part Two

MILTON GOLDSTEIN, D.D.S., Newark, New Jersey

DIGEST

This is the second article in a two-installment series that reports the use of Mephate® in a variety of conditions that are of interest to the dentist: muscle tension, facial paralysis, mandibular repositioning.

Residual Facial Paralysis

Fortunately, most cases of facial paralysis resolve spontaneously in a few weeks or a few months. For those that do not, little has been offered by way of relief from the disfigurement. Faradic stimulation, massage, heat, diathermy, and massive doses of vitamin B_1 and B_{12} are administered in the hope of preventing atrophy of the involved muscles. [11,12] But these seem to have little effect in restoring function to those muscles which do not recover spontaneously. If there is disfigurement for more than six months, nerve anastomosis or muscle transplant of the opposite temporal muscle may be necessary.

Prosthetic Devices Used—Various prosthetic devices attached to a natural tooth or to an artificial denture and designed to pull the sagging tissues up have been designed: (1) One patient made a plastic hook to engage the corner of the mouth. This he attached to a rubber band slung over the ear to effect a questionable cosmetic improvement. (2) A simpler method is to draw the dropped tissues up with clear transparent tape. Depending on the degree of sagging of various muscles, one or more pieces of tape are used.

Plastic Surgery—Thoma[14] speaks of nerve anastomosis, and plastic surgery has been used to lift the paralyzed tissues with fascia lata inserts under the skin from the corner of the mouth to the area of the posterior root of the malar bone. The inherent danger in this procedure is the possibility of severance of the facial nerve itself with no remaining possibility of ever restoring function. And at best the cosmetic improvement disappears when the unparalyzed side is in function.

Rationale in Use of Mephate — When one side of the face is paralyzed, the other side is in relative spasm; the administration of the drug, by its relaxing property and because of its affinity for hypertonic muscles, should cause a lessening of the tonic contraction of the unparalyzed side and thereby at least a temporary cosmetic improvement. It was reasoned that, at least for special occasions, the afflicted person could get a measure of relief from his disfigurement.

Signs of Improvement in Nonfunctioning Muscles—The above rationale proved correct in the first case in which it was tested. An unanticipated reaction also occurred: the previously nonfunctioning muscles began to show some signs of movement. This led the author to postulate that Mephate in addition to its relaxing property also exhibited a sort of controlling property, inducing or facilitating the passage of nerve impulses and therefore, in a sense, aiding in the abolition of the "alienation" which follows the prolonged nonuse of muscles. This can only be postulated. Proof or disproof must be left to those qualified.

Suggestion Combined with Medication Effective—A number of practitioners, both dentists and physicians, on being told of these favorable results from the use of Mephate in facial paralysis, and on seeing the photographic evidence, tend to deprecate the rationale and the method, ascribing the results to suggestion alone. Without detracting from the contributions in the field of psychosomatics, we cannot accept the unrestricted deduction that favorable results are accomplished by suggestion alone. That suggestion is probably an effective aid in treatment is freely admitted, but this does not negate the value of the medication or of the patient's conscious effort to help improve his condition.

Case Reports on Facial Paralysis: Case One

In a male patient, age 47, right unilateral paralysis with sudden onset occurred about nine years before presentation at the author's office. The patient had been treated by one, then another physician. The treatment, as recalled by the patient, included electric stimulation, aureomycin, injections, and powders, (probably vitamins were included). At first, considerable improvement occurred in the disfigurement, and then no further change for nine years. Figure 5 shows the appearance of the patient at his first office visit.

Therapy — Mephate, 3 capsules q.i.d., was prescribed for two days, followed by 4 capsules q.i.d. Improvement in appearance was noticed after one week. At the end of three weeks, the patient was able to hold a cigar

11Schwartz, L. L.: Ethyl Chloride Treatment of Limited Painful Mandibular Movement, JADA **48**:497 (May) 1954.
12Burkett, L. W.: Oral Medicine, Philadelphia, J. B. Lippincott Company, 1946.
13Miller, S. C.: Oral Diagnosis and Treatment, ed. 2, Philadelphia, The Blakiston Company, 1950.

14Thoma, K.: Oral Pathology, ed. 3, St. Louis, C. V. Mosby Company, 1950, p. 1016.

in the right side of his mouth for the first time in nine years. Soon thereafter an involuntary twitching of the left side began and later the patient reported that the "pulling feeling" was gone and that his face "felt softer." Figures 6 and 7 show the improvement obtained.

Improvement Continued — After eight weeks of continuing gradual improvement it was decided that maximum possible results had been obtained and Mephate was withdrawn.

Burning Sensation in Tongue — There was no reappearance of any of the preexisting symptoms but two weeks later the patient reported a burning sensation in the tongue. His physician diagnosed this condition as a symptom of a vitamin B deficiency and administered vitamin B_{12} parenterally and prescribed B-complex orally.

Medication Withdrawn—Was the burning tongue symptomatic of a return of the seventh nerve paralysis, or was it a manifestation of the vitamin deficiency? It was decided to prescribe no other medication, but to wait. Since the patient had been rendered edentulous concurrently with the treatment for the paralysis, it was assumed that his diet might have been deficient.

5. ***Facial paralysis. Maximum function before treatment.***

6. ***More uniform function after six weeks of therapy. Note reduction in size of lips on right side.***

7. ***The cigar is held on the right side for the first time in years.***

Lasting Improvement in Condition —The burning sensation disappeared eventually and has not appeared again for well over a year. The improvement in facial symmetry and function has not regressed. The patient is successfully wearing full dentures which were designed to enhance the previously accomplished cosmetic and functional improvement.

Case Two

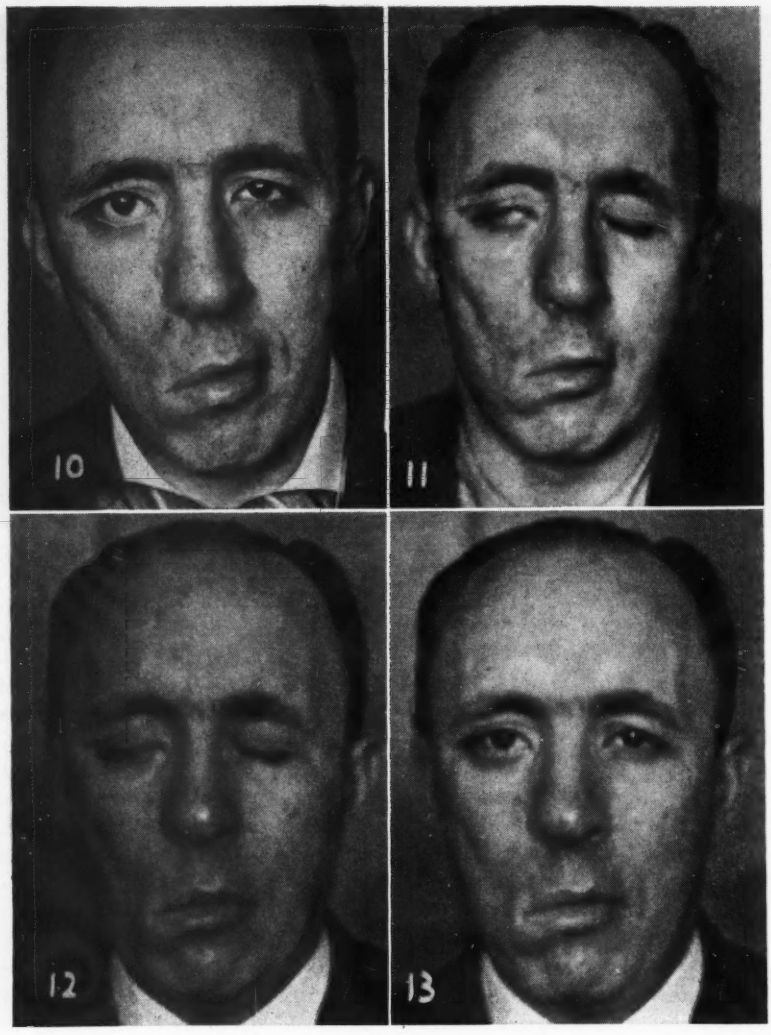
The patient in this case, a woman, age 30, is shown in Figures 8 and 9.

The patient's chief complaint was lacrimation of both eyes at every meal and often at other times as well. The first attack of unilateral paralysis (left side) occurred at age nine. Physiotherapy failed to bring improvement. Chiropractic treatment helped. During nursing training the right side suffered paralysis. Physiotherapy failed. At the training hospital craniotomy was offered but was refused. It was believed that there might be abnormal intercranial pressure, relief of which might correct the condition.

Mephate Prescribed—Two capsules of Mephate q.i.d. were prescribed and in 24 hours there was some lessening

8. ***Residual facial paralysis. Before treatment. Note that eyes close in smiling.***

9. ***After treatment the smile is higher and the eyes less closed.***



10. ***Facial paralysis. Condition before treatment.***

11. ***Note Bell's sign on attempting to close the eyes.***

12. ***Note ability to close the right eye after three weeks of therapy.***

13. ***Maximum improvement in appearance.***

of the disparity between the two sides of the face. The smile was somewhat less distorted and the eyes showed a decreased tendency to tears and to close while smiling.

Definite Improvement Noted—After one week of Mephate therapy the patient presented the following conditions:

1. She could whistle although unable to do so before treatment.
2. Lacrimation was greatly reduced.
3. Friends volunteered that there was an improvement in appearance.
4. The upper teeth showed more in smiling (Fig. 9).

Some Preexisting Symptoms Returned—The patient decided to take no more of the drug because all muscles had become relaxed. Within three days 50 per cent of the preexisting symptoms returned. There was no further contact with this patient.

Case Three

Unilateral Bell's palsy, right side. This patient ran the entire gamut of treatment including 50 to 60 sine wave treatments, vitamin B_{12}, physiotherapy, ultraviolet light, and finally, plastic surgery. The latter was an attempt to lift the right corner of the mouth with fascia lata inserts attached under the skin, to the corner of the mouth and to the area in front of the ear. Two were used.

Results of Surgery — There was some immediate cosmetic improvement but later the grafts slipped and the patient was worse off than before the surgery. The right side of the face became cold and there was complete flaccidity with no buccinator function. Removal of food from the buccal sulcus with the finger became necessary. Tests with faradic stimulation showed that the muscles were capable of contracting; there was confirmation of the suspicion that the seventh nerve branches and the buccinator nerve had been severed in surgery.

Slight Change from Administration of Mephate—The photographs, Figures 10, 11, 12, and 13 indicate the original condition and the subsequent slight changes following administration of Mephate. There was a slightly lessened tendency to accumulate food in the sulcus, a feeling of warmth in the forehead and the voluntary closure of the right eye became a little more complete.

This case must be considered essentially a failure. Because of the surgical destruction of the nerves there was no possibility of success.

Case Four

This case of Bell's Palsy, right side, in a man age 54 is shown in Figures 14. 15, 16, 17, and 18.

Previous Treatment—The application of heat to the affected side was the only treatment that had been effected. On presentation, the duration of the paralysis was about ten days. The facial distortion was noted for the first time on arising one morning. The day before the patient had driven his car with the window open and while inadequately clothed for the cold weather.

Symptoms Noted—The following conditions were observed:

1. The right eye could be closed only half way (Fig. 15).
2. The smile was severely distorted.
3. The relaxed face was distorted (Fig. 14).
4. The lips caught between the teeth.

14. ***Original condition.***

15. ***Shows the patient's inability to close the right eye.***

16. ***After three doses of Mephate the the right eye can be almost completely closed.***

17. ***The patient attempted to smile on the second day of treatment.***

18. ***The patient is encouraged by the improvement and hopes to continue.***

5. Water spilled from the right corner of the mouth.

Mephate Therapy Effective—After three doses of Mephate (3 capsules at first, then 4 per dose) the right eye could be closed almost completely (Fig. 16). The facial distortion was decreased and function increased. These improved from day to day and after one week the improvement was judged to be nearly complete (Figs. 17 and 18).

Comment — The patient in Case Four was seen during the acute stage of the disease and might have enjoyed spontaneous remission of the paralysis without any treatment, yet the rapid decrease in the distortion of the face and the equally rapid improvement in function points to assistance at least from the drug and not merely a coincidence.

Mephate Helpful in Mandibular Repositioning

Mandibles sometimes veer away from their original postural relationships. Those who have occasionally attempted to guide a mandible back to its starting point, know how difficult the procedure can be. The acquired jaw habits, deeply ingrained in the patient's neuromuscular patterns, are extremely difficult to replace with new ones.

Distal Drifting of Mandible—In the case of one patient, a man in his forties, all diagnostic factors pointed to a distal drifting of the mandible, extreme closure, and a wide shift to the right.

Premedication with Mephate — When the new constructions (veneer crowns, fixed bridge, and partial denture) were about ready to be inserted in the mouth, the patient began to take Mephate in the usual dosage. Medication preceded the insertion of the oral reconstruction by two days. The patient was fully and completely reoriented in his renewed mandibular posture in a few days and has to date not reverted to a distal bite.

Conclusions

The limited clinical investigation of Mephate in dentistry has shown sufficient positive results to commend the further study of the drug on a wider scale.

The most dramatic results were in some of the flaccid and in one spastic condition of the face. The use of Mephate as premedication to help get nervous patients started on necessary treatments is, in the author's opinion, its most important value in dentistry.

The author will welcome reports on the use of Mephate by other practitioners.

One Johnson Avenue

The AGING MOUTH

LOREN DON SAYRE, D.D.S.,

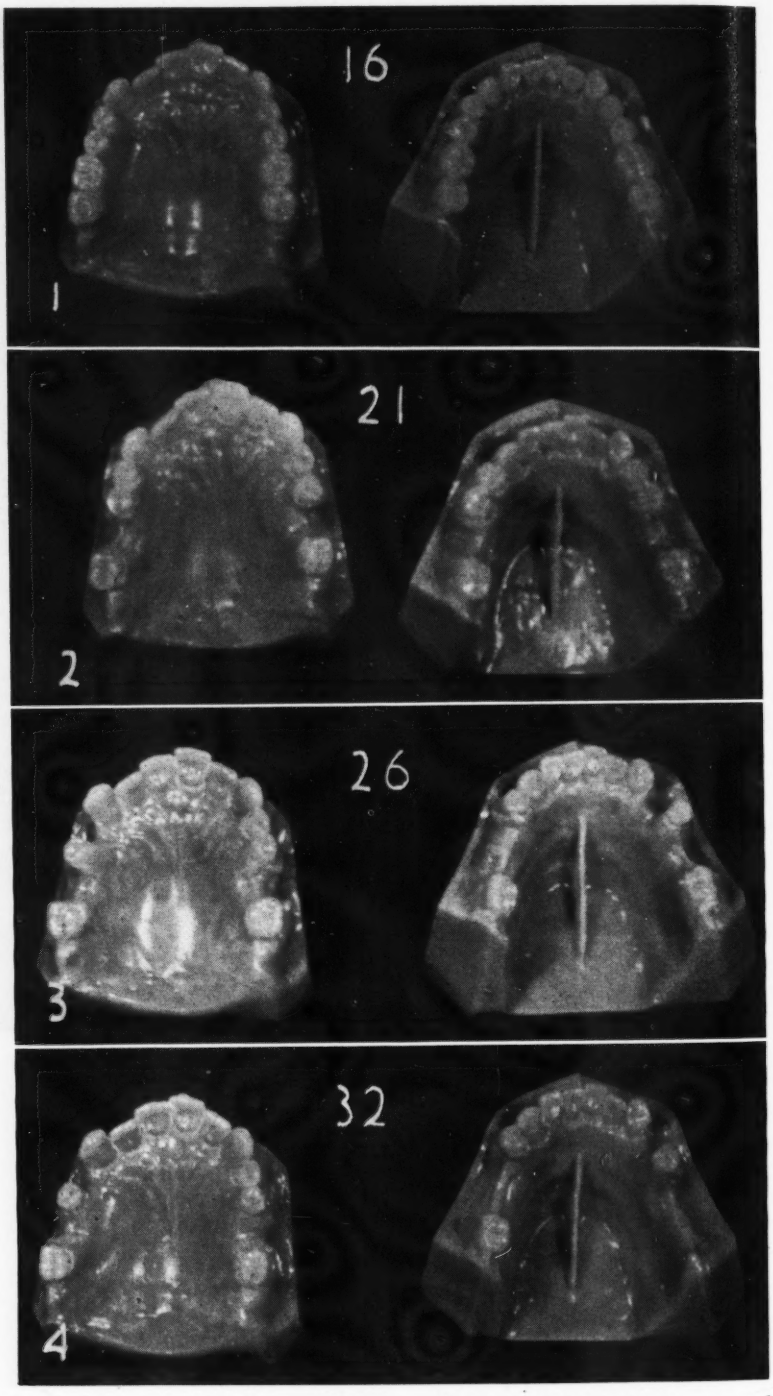
Chicago

DIGEST

The increasing length of the life span of patients has caused the thoughtful dentist to consider and reconsider the life expectancy of the natural dentition. The law of averages is the basis of a philosophy which may vary with the individual patient, but which results in general tenets and teaching, or educational principles which should be presented to patients long before a personal dental trend has developed. This article illustrates the general condition of the mouth as it has been observed in patients at ages varying from age 14 to advanced old age, and suggests the practical advice to be given patients for improved preservation of natural teeth.

Interest Stimulated in Dental Subjects

The amount of publicity given to life expectancy of the American citizen has promoted interest in the life expectancy of his teeth. This subject is the one most frequently brought up by the patient and certainly requires an intelligent response. What patients are told, however, is quoted and discussed at home and finally becomes a topic of conversation with friends



1. *Age 16. At the time of optimal efficiency, before the third molars have caused any great movement of the occluding teeth.*

2. *Age 21. The first molars have been removed due to the patient's indifference and ignorance of their primary importance.*

3. *Age 26. The loss of the bicuspids is shown, sometimes the first, sometimes the second bicuspid. There seems to be no definite pattern in the loss of these teeth.*

4. *Age 32. Beginning gingival resorption is shown and the first indication that at least one removable bridge should be expected to be worn.*

and relatives. Knowing this to be true, the dentist must recognize the value of restraint in undertaking patient education.

General Factors in Tooth Development

It can be assumed that between the ages of 14 and 16 the mouth will have matured as far as teeth are concerned. The physique, or muscle and body development, will reach its maximum at the age of 28. The "miler" or pro football player is an example. But with the exception of the third molars which may or may not appear, the mouth has as close to 100 per cent function as it will ever have before the patient leaves high school.

The Teeth at College Age—By the age of 20 when physical stamina is approaching college level, the patient can generally be expected to have lost two teeth. Incidentally, it might be pointed out that the loss in the function of mastication is thus reduced roughly 20 per cent by this loss.

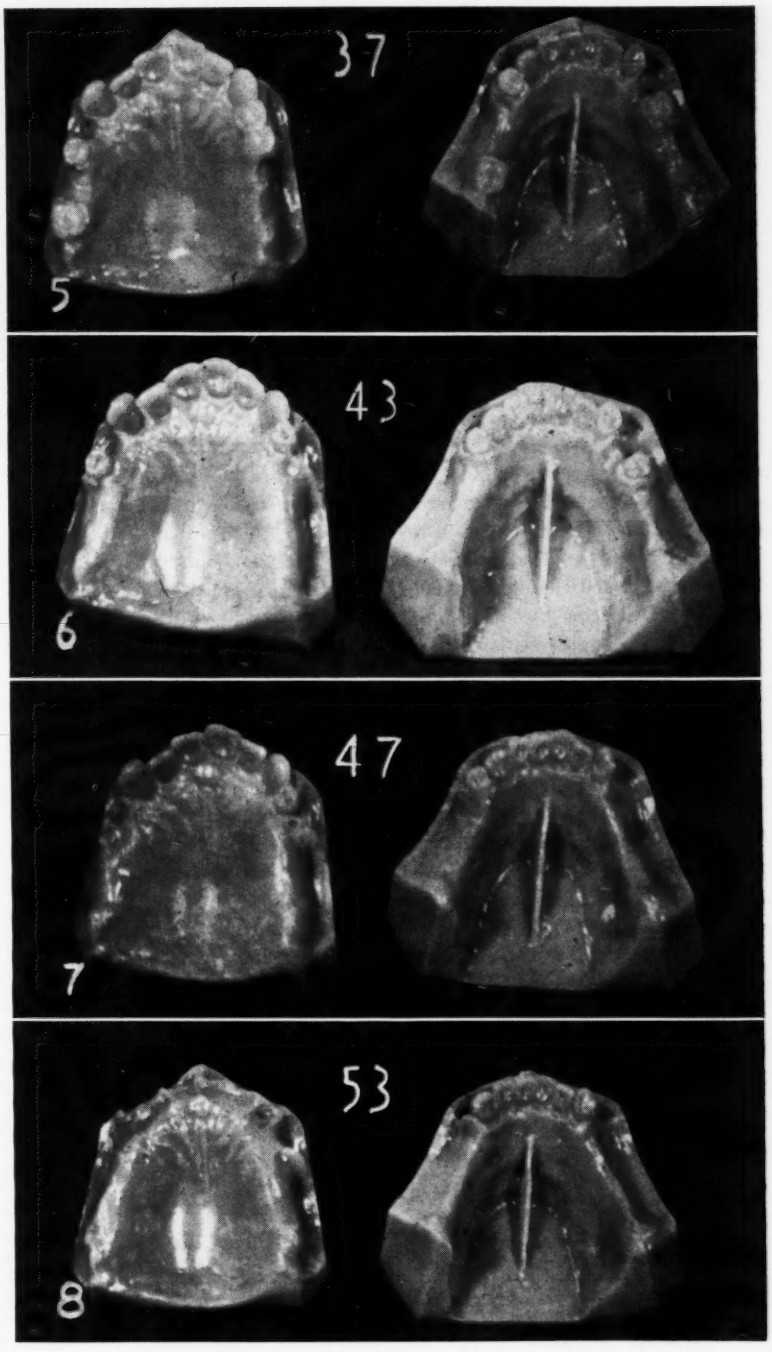
The Teeth in Early Maturity—By the age of 25 it can be expected that three teeth will have been extracted. The teeth most likely to have been lost are the first molars. By the age of 30 the patient can be expected to have lost five teeth. The next most likely teeth lost are the second molars.

Degeneration of Teeth

Interest in root canal therapy is increasing. This interest is healthy and the need for this procedure is obviously a vital one. Before the patient has begun to be really well-established in home or business life, his dental needs have grown rapidly and usually when finances are the least available for maximum dental care. In many cases only root-canal therapy will help solve the problem.

Value of Regular Therapy — Studies made show that money spent on dental care at an optimal rate keep more teeth efficient longer. This demonstrates that the early and continued spending of money produces maximum efficiency until the age of 45. At this point the previously spent money shows its greatest value.

Deterioration Continues — The



5. *Age 37. Enough posterior abutments are gone to require both upper and lower partial dentures for the average patient.*

6. *Age 43. Both arches now require free-end saddles and the future of the mouth is dependent on the supporting structures.*

7. *Age 47. The ridges, as shown here, indicate the degree of success that can be expected from complete dentures.*

8. *Age 53. An immediate upper denture and two Kennedy continuous clasp lower partial dentures could maintain this mouth in relatively satisfactory condition for many years.*

difference between efficiency and inefficiency is reduced after age 45 until by the age of 63 all inequalities are more or less eliminated. At that time a patient can expect to be edentulous despite the amount of money spent on treatment.

Bone Preservation Important—The amount of bony support will vary with the patient. The more bone that has been preserved to this age will be of the greatest value as support. This cannot be evaluated individually or generally. But it can be estimated that the male can expect to live to be 68 and the female over 70. If dentists are to serve the patient efficiently, this fact must be remembered.

Decrease in Biting Strength—During the period of mouth degeneration it can be expected that the patient's bite will revert from the 300 pounds per square inch possible and likely in youth, to the 150 pounds per square inch in patients in middle age, to the roughly 60 pounds of biting strength in the fully edentulous patient. Biting strength will be lost rapidly in the group of patients who breakfast on orange juice, coffee, and toast, with a sweet roll and coffee at the 10 o'clock break. Finally discouraged by rampant caries, these patients request full upper and lower dentures to eliminate the problem of caries.

Patient Education

A more hopeful situation might be arranged if the dentist were to explain to the patient as he matures and declines the necessity of developing new habits, such as foregoing snacks and sugar once a partial denture is to be worn. Explain why this diet correction will preserve the partial. A parallel is that of the healthy man who takes only two weeks' vacation in his twenties, more days off as well as weeks off in his thirties, and who by the age of 65 has prepared for retirement by gradually reducing his work load over the years. The dental patient, however, wants to eat steak, raw apples, and taffy to the age of 90 although his equipment for eating, like his physique, has long passed its zenith.

9. ***Age 63. In worse condition than the average person's eyesight, hearing, or heart function is the average person's mouth.***

General Health Problems—Discussions with the patient on the effects of declining mouth efficiency as related to stomach disorders, weight problems, and nutrition will be of value.

Introduction of Partial Dentures—By the age of 37 the patient should be prepared to wear a removal partial denture, probably an upper although cases vary and the partial may be either an upper or lower. As the teeth continue to exfoliate, the opposing partial will likely be indicated and in place by the age of 45.

Rate of Carious Process—The degree of caries is highest in youth, declining sharply upon marriage, and maintaining a fairly constant rate thereafter until age 45 when tissue recession and greater leisure encourage an increase of caries. From 45 on, the loss of teeth is not primarily due to infection but to recession, exposing bifurcations, broken and nonsalvageable teeth, and teeth weakened by the excessive loads placed on them. Knowledge of these factors will be helpful to the patient.

Dental Information of Vital Importance

Ninety five per cent of the families in the United States have cars, one-third have two cars. No one expects to keep his car over five years and all understand the factor of depreciation. Much more personal, more constantly used, and more important to well-being are the teeth of these same people.

30 *North Michigan Avenue*

Some Limits to Popular Science

SCIENCE would be an uninspiring business if it consisted of no more than the collection of new facts and their application for practical ends. These are but the beginning and the rounding off of a complex process. To be manageable, facts have to be marshaled within the limits of general laws, from which in turn new facts may be deduced. Practical applications almost invariably call for the solution of problems scarcely less difficult — and indeed, often more difficult — than those involved in the original discovery. Many nonmaterial factors also are involved: imagination to see the significance of facts, pleasure from the pursuit of knowledge for its own sake, the satisfaction of the creative impulse.

From *Science* **124**:207 (August) 1956.

SURGICAL PREPARATION

for Oral Prosthesis

LOUIS CHARLES ESKIN, D.D.S., Philadelphia

DIGEST

Much inconvenience to the patient and embarrassment to the dentist may be avoided by predetermining the conditions of the oral structures before attempting denture construction. The proper approach to this problem should include a comprehensive medical history, careful clinical, roentgenographic, and cast studies.

A medical history may reveal evidence of some systemic disease which alters the oral structures and interferes with denture stability. There are various systemic processes which result in atrophic, hypertrophic, inflammatory, or necrotic conditions of the jaw bones. This article discusses some of the most common surgical techniques to be applied in situations where abnormalities interfere with the comfort, stability, or esthetics of an artificial denture.

Oral Conditions Commonly Encountered

Some of the common disclosures during clinical and radiographic studies of the oral cavity are (1) retained roots, (2) apexes of teeth, (3) residual areas of infection, (4) bony prominences, (5) malformations, (6) deformities, (7) cysts, (8) impacted teeth, (9) osteosclerosis, (10) abnormal pterygomandibular folds, (11) extensively large frenae, (12) neoplasms, (13) sharp bone edges, (14) foreign bodies, and (15) hypertrophic or hyperplastic tissues.

Careful Examination Required—It is important to examine carefully and to evaluate the musculature of the oral cavity. Pendleton[1] in his study of the gross anatomy of the denture supporting tissues stated "the muscles of the facial system influence stability and retention as they affect the development of border line adaptation and as they engage the labiobuccal surfaces of the denture. The facial muscles of expression affect adaptive contacts by virtue of their attachments to the mucosa. The mechanism of the facial muscles of expression is complex. They may serve the stability and retention of the denture when properly employed, or they may be an impediment when encroached upon. Collagenous tissues are unsuited for use where they form adaptive contacts with the denture because of their lack of elasticity."

Prerequisite to Retention—The elastic quality of the supporting tissues is a prerequisite to denture retention. Pendleton further concludes that "treatment problems frequently occur at the lateral borders of the posterior nasal spine and in the locality of the medial boundary of the hamular notch. It is difficult to control adaptive contacts in these areas when the maxillary tuberosities and soft palate display irregularities in form and character usually accompanied by exaggerated action of the musculature." Consideration of the muscle relationships is therefore fundamental to the treatment of the edentulous condition with prosthetic replacement.

[1]Pendleton, Elbert C.: JADA **33**:219-34 (Feb.) 1946.

Possible Deterrents to Successful Reconstruction—Many congenital or acquired abnormalities of bone may exist prior to or following the removal of teeth. They are more comon to the maxilla than the mandible, appearing as bulky masses projecting palatally or buccally, or both. While the teeth are present and no reconstruction is contemplated, many bony prominences or concrescences have no pathologic or surgical significance. In the edentulous mouth, however, they assume a different aspect and may become a deterrent to the proposed objective.

Latent Sources of Irritation—Not only are the stability, comfort, and esthetics of a prosthetic replacement of concern, but there are the more serious sequelae possible under the pressure and forces of a restoration upon the latent sources of irritation or infection to be considered.

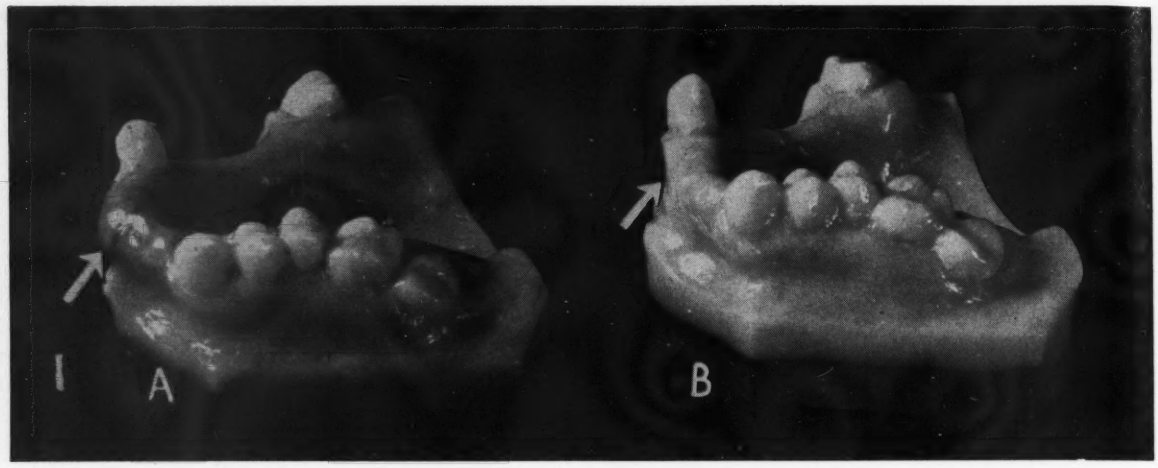
Types of Abnormalities Requiring Surgical Treatment

The most common abnormalities of the jaws which basically require similar treatment are (1) irregular ridges, (2) bony eminences, (3) large tuberosities with undercuts, (4) bulging, unusually wide and heavy ridges which decrease the vertical dimension, (5) exostoses, and (6) bony hypertrophies. All surgical procedures must be performed with care by a specific technique under aseptic conditions.

Surgical Procedures

Flap Operation—A suitable flap operation may be executed in the following manner:

1. An incision is carried along the crest of the ridge from approximately



1 millimeter distal to a point of about 1 millimeter mesial to the defect and connected by vertical or mesio-oblique and disto-oblique incisions to the mucobuccal fold. The prime purpose is to maintain a good bony base for return of the flap to position and to avoid tearing of the soft tissues.

2. The mucoperiosteal flap is reflected with a periosteal elevator, osteotome or wax spatula of suitable size and retracted from the bone to full view.

3. By judicious use of suitable rongeurs, bone forceps, surgical burs, or appropriate bone chisels, the overextended or enlarged bony surfaces are reduced to the desired distance.

4. The bone must always be finished smooth with bone files, moist heatless or diamond stones.

5. Careful debridement of the operated area is important to ensure the removal of all loose bone fragments or foreign material and is followed by irrigation with warm sterile saline solution.

1. ***(A) Before alveolectomy. (B) After alveolectomy.***

6. The efficient use of an aspirator by the assistant will produce a dry field and ensure good visualization.

7. The mucoperiosteal flap is returned to position over the bone, the excess mucous membrane trimmed, so that the edges approximate and fit snugly over the alveolar ridge. Failure to excise the excess soft tissue before suturing will result in a soft flabby alveolar ridge.

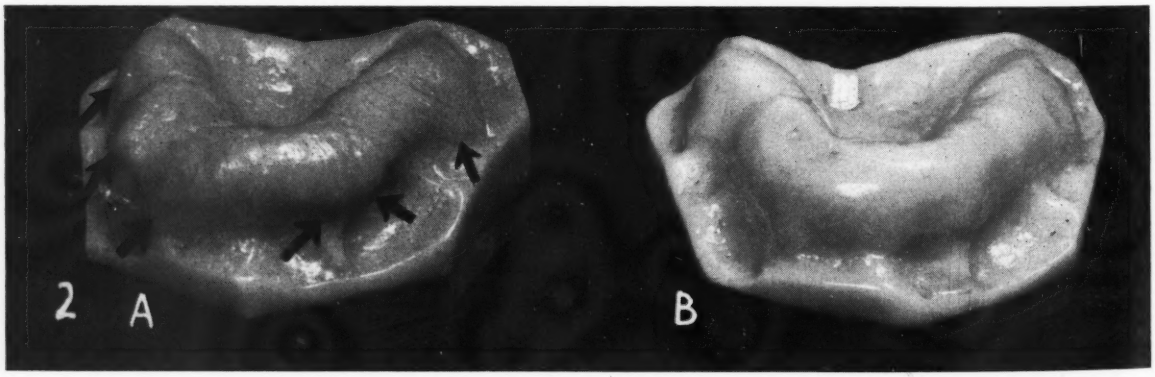
8. Excessive tension upon the edges of the mucosa should be avoided upon closing the wound, which interferes with circulation, resulting in poor union, tissue sloughing, and undue bone exposure.

9. Suturing may be accomplished by the interrupted or continuous method. The sutures should always be placed across regions supported by bone to prevent forcing of the soft tissue into a remaining socket or space.

10. The knot of a suture should always be placed to one side of the wound, never on the edges of the wound. Otherwise the result will be (1) an irregularity in healing, (2) exposure of the interseptal bone, or (3) sloughing of the tissue, exposing a large portion of bone with painful delayed healing.

Alveolectomy — When performing an alveolectomy at the time teeth are removed, incisions are usually not required. It is only necessary to cut through the interdental papillae, lifting the mucoperiosteum labially and lingually, thereby exposing the bone to full view. A carefully executed alveolectomy results in a ridge upon which a denture may be seated with greater comfort and retention, with satisfaction to both the patient and the operator (Figs. 1 and 2).

2. ***(A) Before alveolectomy. (B) After alveolectomy.***



Extreme Maxillary Protrusions—Alveolectomy and alveoplasty are indicated in extreme maxillary protrusions which for some reason cannot be corrected by orthodontic means. The following measures may be taken:

1. If the amount of bone to be reduced is not too great, an intercortical septal alveolectomy and collapse of the outer alveolar plate by compression is sufficient to produce good results.

2. In the more severe cases it becomes necessary to remove the alveolar septae, the entire labial alveolar plate, performing a labial alveoplasty, and creating a new ridge. Actually, this is a reduction of the maxilla and reattachment of the muscles in the immediate region of bone reduction to increase the distance from the alveolar ridge to the mucolabial fold.

Removal of Hypertrophied Tissue—Local bone atrophy or destruction of the alveolar ridge with hypertrophy of the surrounding mucosa is not an uncommon sequel of periodontal disease, severe trauma during the removal of teeth, an ill-fitting denture or one worn in unbalanced occlusion for a long period. The ridge is usually irregular with little depth for denture retention. The hypertrophied flabby tissue is an inflammatory hyperplasia, consisting of a mass of fibrous and adipose tissue.[2] If the flabby mass is not heavy, its removal is a rather simple procedure.

1. The tissue is grasped with a hemostat or Allis forcep and excised elliptically.

2. Sutures may or may not be necessary, depending on the site of excision and the occurrence of hemorrhage.

Excision of Heavy Hypertrophied Tissue—When the hypertrophied tissue is heavy, simple excision of the mass may create an extensive tough cicatrix which will later displace an artificial denture. To produce a better ridge and avoid tissue interference to a prosthetic replacement, it is prudent to take the following measures:

1. Make transverse incisions above and below the mass.

2. Retract the mucoperiosteum and freely dissect out the hypertrophied tissue close to the bone.

3. The mucoperiosteal flap is returned, the excess mucosa properly trimmed, and the wound closed by suturing.

Correction of Extremely Low Irregular Ridge—This is more extensive and requires surgical experience. A flap must be reflected to correct the ridge deformity. This measure is followed by a plastic procedure of the soft tissues or myotomy of the musculature, thereby increasing the vertical dimension of the vestibule. Some modification of the Kazanjian technique may be employed for the purpose.[5]

Torus Palatinus

The torus palatinus, usually found in the midline of the palate, is defined differently by various authors. Some consider the bony outgrowth as a tumor, while others classify it as a hyperostosis or bony growth of the palatal processes.[3,4,5] It may assume a variety of forms, such as the simple, multiple, lobulated, or spindle shaped.

Differential Diagnosis— As stated by Mead,[5] the diagnosis of torus palatinus must be differentiated from inflammatory traumatic exostoses, osteoma, follicular cyst, impacted or unerupted teeth, abscess, lipoma, and gumma.

Indication for Surgery—Surgical interference for removal of the torus palatinus is indicated (1) when the overlying soft tissues are readily traumatized, becoming irritated, or (2) when there is interference with the proper seating of a denture. Removal of the torus palatinus requires the utmost care, because of the danger of perforating the hard palate.

Removal Technique—Numerous techniques have been suggested for the removal of the torus palatinus. The Y, or semicircular incision and retraction of the mucosa are the most commonly used methods to expose the bony growth. Great care must be exercised in reflecting the mucoperiosteal flap, since the tissue is extremely thin and may be easily torn. The small torus removal is easily accomplished with the use of a chisel or rongeur, and the bone smoothed with a bone file.

Method for Large Tori—The larger tori may also be removed with gouges, burs, or chisel and mallet. In the case of the large or lobulated torus, however, the removal may be simplified in the following manner:

1. Numerous drill holes are placed several millimeters apart with bone burs through the growth.

2. The holes are connected by cutting across with a crosscut fissure bur.

3. The bone is then easily removed in sections with a chisel.

4. The bone may be made smooth with bone files, a lubricated heatless or diamond stone.

5. The excess mucoperiosteal tissue should be trimmed so that the edges approximate, and several sutures inserted to close the wound (Fig. 3).

Removal of Mandibular Lingual Tori—These are shelf-like excrescences which are an interference to lower denture adaptation or to the use of a lingual bar appliance. These tori may be removed by a flap retraction and the use of a sharp chisel or osteotome. One blow, often is sufficient to cleave the overgrowth.

Problems in Denture Retention

The low attached or overhanging labial frenum is a frequent problem in denture retention.

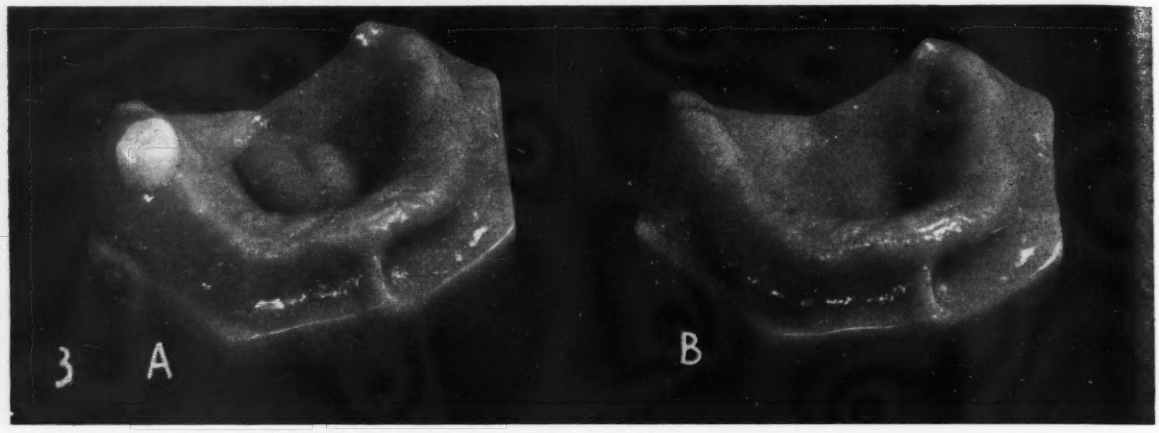
Surgical Procedure — 1. The frenum may be grasped with a hemostat. The tissue around and under the instrument is excised with a sharp pointed blade down to the periosteum.

2. When the excision is complete, the hemostat will fall away with the tissue in it.

3. The resulting edges of the wound are undermined, approximated and the wound closed vertically by interrupted sutures.

Second Procedure—Another method, as described by Archer[6] may be accomplished by the use of two hemostats. The following steps are taken:

[2]Bernier, Joseph L.: A Manual for the Differential Diagnosis of Oral Lesions, St. Louis, C. V. Mosby Co., 1942, p. 27.
[3]Thoma, Kurt H.: Oral Surgery, St. Louis, C. V. Mosby., 1948, p. 1223.
[4]Winter, Leo: Operative Oral Surgery, ed. 2, St. Louis, C. V. Mosby Co., 1943, p. 502.
[5]Mead, Sterling V.: Oral Surgery, ed. 3, St. Louis, C. V. Mosby Co., 1946, pp. 675-668.



3. ***(A) Before surgery. (B) After surgery.***

1. The lip is raised and the portion of the frenum below the mucobuccal fold is grasped with the hemostat.

2. The lip is pulled up and outward until it is at right angles to the labial surface of the alveolar process.

3. The portion of frenum under the lip and mucobuccal fold is grasped with a hemostat at right angles to the first hemostat.

4. The tips of the two hemostat beaks should touch each other. The labial frenum is engaged between them forming an inverted V.

5. The tissue is excised by completely cutting around the outside of the two hemostats.

6. One suture is placed directly at the mucobuccal fold and several above, under the lip, to close the wound. No sutures are inserted on the labial surface of the alveolar ridge.

7. Several thicknesses of 1-inch iodoform gauze are placed at the muccobuccal fold and over the wound on the labial surface of the alveolar ridge. The dressing may be removed within four to six hours. Healing usually takes places by first intention.

Excision of the Abnormal Lingual Frenum—This is best accomplished by raising the tongue upward and bringing the frenum to full view.

1. The frenum is cut across with scissors or a sharp pointed blade to the floor of the mouth.

2. The wound is closed vertically by interrupted sutures, in the floors of the mouth and under the tongue.

3. Hemmorhage may be anticipated in this region but can be controlled by ligation of the several small vessels.

4. Special care must be observed to avoid injury to the carunculae salivares and ducts of the submaxillary glands.

Correction of Extremely Short Upper Lip and Frenum—This condition which creates difficulty in setting the labial portion of an upper denture, can be corrected by a modified Dorrance operation.[7] The operative procedure resulting in a division of the muscles which elevate the upper lip is completed in the following manner:

1. An incision is made across the mucoperiosteum at the mucobuccal fold from cuspid to cuspid.

2. The tissues are raised from the bone with a periosteal elevator up to the side of the nose, infraorbital ridge, and laterally to the zygoma.

3. A right-angle knife is inserted at the outer limits of the elevated tissues and, with its point turned toward the skin, the muscles are divided to, and part way up, the side of the nose.

4. The procedure is repeated on the opposite side and at the alae of the nose.

5. Instead of packing and not suturing the wound as stated in the original technique this writer recommends suturing a Number 8 catheter tubing to the free edges of the wound with several 1-inch iodoform gauze drains inserted between the sutures into the deeper spaces. The drains are removed about the third or fourth day and the tubing within the sixth or seventh day.

6. Postoperative edema and discoloration of the lip and face which are common clears in about two weeks. Sometimes there is a loss of sensation in the infraorbital region which is not permanent. Normal sensation usually returns in two to three months.

Comments and Conclusions

This article has been confined primarily to a discussion of the more common phases of oral surgery encountered in properly preparing the mouth for dental prosthesis. Satisfactory surgery of the oral cavity must be performed with good vision and a definite surgical technique under sterile conditions.

It is self evident that the stability, comfort, and esthetics of a denture are directly proportional to the health of the patient, anatomic form, and relationship of the hard and soft structures.

Only by using every diagnostic means to determine and correct the various oral aberrations, can failure be avoided in prosthetic replacement. At times, it may be judicious for the dentist to recognize his qualifications or limitations and seek consultation to ensure successful treatment. The primary interest should be the type of service rendered and the results obtained.

2119 *Spruce Street*

[6]Archer, W. Harry: A Manual of Oral Surgery, Philadelphia, W. B. Saunders Co., 1952, p. 159.

[7]Dorrance, George M., and Loudebslager, Paul E.: Hypermotility of the Upper Lip, Surg., Gynec. and Obstet. **75**:790-791 (Dec.) 1942.

The EDITOR'S Page

DENTAL caries is not a simple or single event of chemical dissolution of inorganic material. Such an approach is lacking in biologic breadth. Tooth decay is a complex process that involves the destruction of both organic and inorganic tissues by proteolytic action and by acidogenesis. Bacteria, acids, enzymes, the substrate are participants in the disease process. There may be other biologic mechanisms involved that are unknown at the level of our present knowledge.

A challenging speculation on the etiology of caries has been advanced by Schatz and Martin of the National Agricultural College:

"It has been suggested that acidogenesis and proteolysis are probably involved as independent reactions in tooth decay. However, decalcification (perhaps independent of pH) and proteolysis (not necessarily under alkaline conditions) may occur simultaneously as two manifestations of the same overall mechanism. If dental caries results from proteolysis combined with chelation, these dual effects may account for destruction of the organic as well as the inorganic constituents of teeth at the same time. Rod disintegration through the formation of soluble chelate complexes composed of calcium and protein breakdown products may therefore question the view that acid decalcification is the cause of dental caries. Theoretically, proteolysis-chelation alone may be an initiating factor in tooth decay."[1]

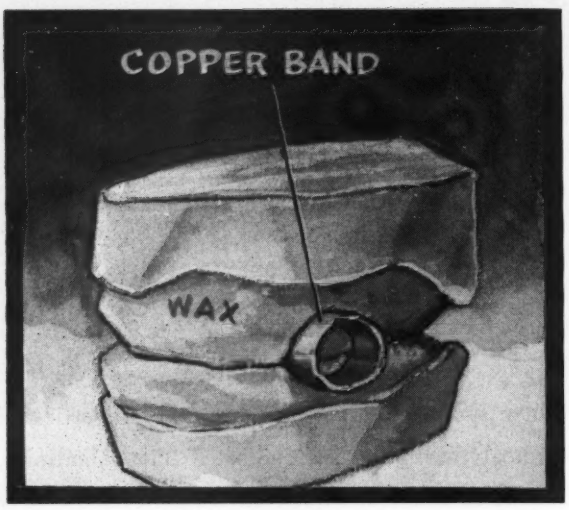
One of the most significant parts of this theory is the view that *acid production may be an anticaries factor rather than the agent that initiates caries.* Since the days of Miller dentists have believed that certain bacterial organisms in the mouth fermented carbohydrates to produce acid that decalcified teeth. We have looked upon caries of the enamel as a pure chemical reaction. Only in recent years have we given consideration to the organic matrix and the nature of its destruction in caries.

The theory of an anticaries factor that is concerned with acid production is based on the general biologic fact that acid suppresses proteolytic and other spoilage organisms. "Certain properties of proteolytic microflora indicated that alkalinity, which is now considered to be anticarious, may actually exert a potentiating action on the proteolytic breakdown of enamel organic matrix."

The fact that these two workers have expressed a theory is not to say that we should forsake our past beliefs on the acidogenic aspects of caries. Despite how well a piece of research is conceived and executed it requires substantiation from other workers before it is generally accepted. Schatz and Martin have stated with full honesty that their point of view is speculative. Until this theory is more fully examined and made the subject of critical studies, we should accept the concept as one of intense interest, but not of clinical fact.

The broad biologic base upon which Schatz and Martin have formulated their theory is commendable. So much dental research in the past has been separated from the main stream of science. Dental research workers have tinkered in their isolated laboratories and have concerned themselves almost exclusively with teeth. The riddle of tooth decay—or any disease—can never be penetrated by such a cloistered and circumscribed approach. Teeth are parts of a total organism and that organism operates in a complex environmental field. In this field are forces, powers, energies at work that influence every part of the organism—including the dental apparatus.

[1]Schatz, Albert, and Martin, Joseph J.: Speculation on Lactobacilli and Acid as Possible Anti-caries Factors, New York Dental Journal 21:367-379 (October) 1955.



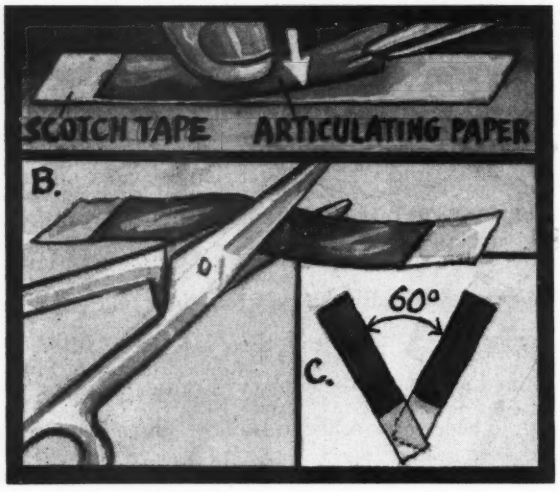
1

Clinical and Laborator

Sealing Bite Registration

Captain Robert Averbach (DC) Fort Holabird, Maryland

1. After the final bite recording has been made, the bite-blocks may be sealed together by inserting a heated copper band into both the right and left sides of the wax blocks.

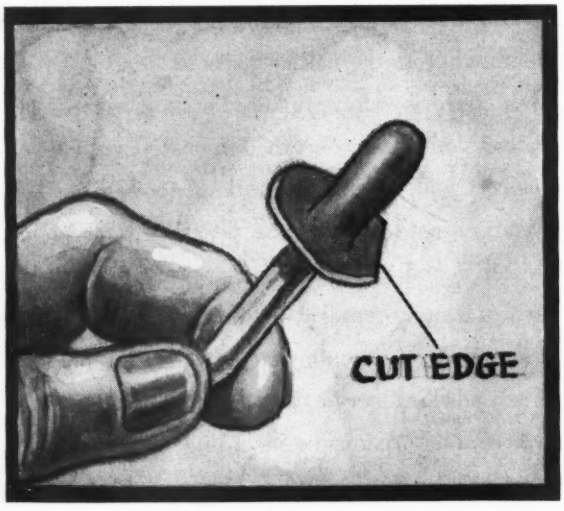


2

Bilateral Registrations

Frank Popper, L.D.S., R.C.S., M.S.D., Johannesburg, South Africa

2. To obtain bilateral registration: A) Stick a 4-inch length of articulating paper with curl downwards on a longer piece of Scotch® tape. B) Cut in half. C) Press the adhesive ends together to form an angle of 60°. This "V" shape allows the carbon paper to be used for bilateral registrations.



3

Stabilizing a Medicine Dropper

Earl D. Fritsch, D.D.S., Highland Park, Illinois

3. To prevent a liquid-dropper from rolling around on the tray, cut off one side of the soft rubber flange.

READERS *are Urged to Collect $10.00*

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay $10.00 on publication.

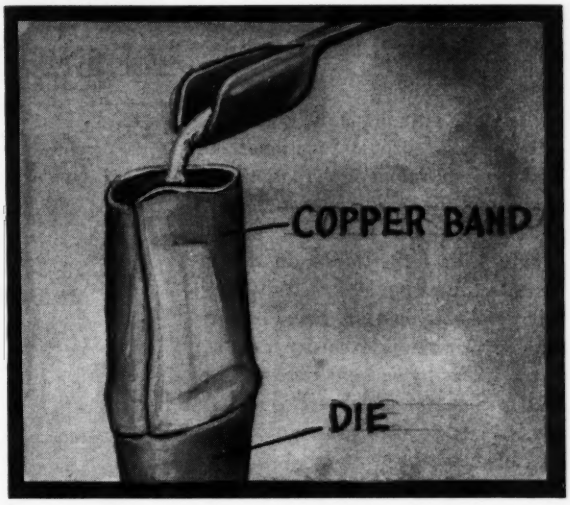
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

A Transfer Coping

Bernard Older, D.D.S., Hartford, Connecticut

4. Save the copper band after a copper die has been made. Place the band in snug position over the die. Pour Melotte's metal into the band and allow to cool. This makes an accurate and inexpensive transfer coping.



4

Emergency Electric Sterilizer

Harry Maeth, D.D.S., Mosinee, Wisconsin

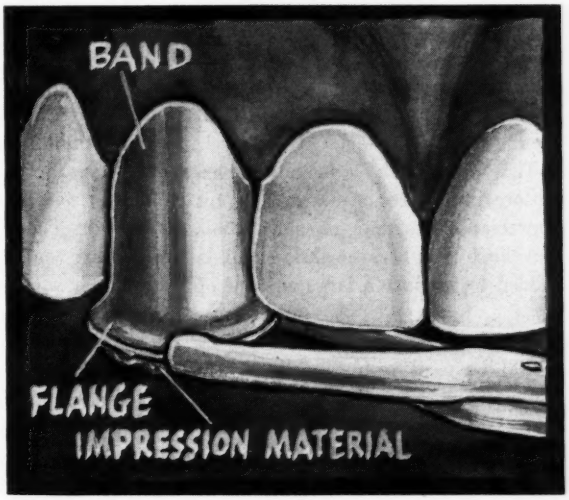
5. For emergency use only, until a new sterilizer is obtained, an electric automatic deepfry pan may be used for either water or oil sterilization.

5

Removal of Copper Band Impressions

Natalie Stein, D.D.S., New York

6. Flare the edges of the copper band with collaring pliers. Grasp this flange with Rongeur forceps when the impression is removed from the tooth. This procedure prevents distortion of the impression.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 518 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

MEDICINE and the Biologic Sciences

Celiac Disease—Diet

Patients with idopathic celiac disease have a chronic functional disorder of intestinal assimilation. Fat loss alters the body contour. Loss of muscle tone and abdominal fat together with fermentation in the intestines causes the abdomen to bulge. The stools are pale and bulky because unabsorbed fat is excessive and are made frothy by carbohydrate fermentation. Signs of malabsorption of vitamin A, sugar, and protein may also be noted.

Stainable fat and undigested starch in the stool are not signs of celiac disease. Stainable fat varies with the percentage of fat in the stool. Fecal fat, however, and fat absorption are not correlated. The iodine test, used to detect undigested starch, has no significance if the patient does not have symptoms. Healthy infants who are gaining weight often react positively.

Response to dietary treatment is a poor diagnostic index. All celiac diets appear to produce excellent results, since spontaneous improvement is common.

Foods that are poorly absorbed should not be removed from the diet. Intolerance to a food is not necessarily induced by an excess of the food. An exogenous factor may impair the mechanism of absorption. Increased fecal loss after the food is included in the diet demonstrates rather than causes the intolerance.

Patients with celiac disease improve when a standard milk diet is supplemented by additional fat. Loss of fat in feces occurs, but the amount of fat absorbed is also elevated.

The diet may also include sugar. Absorption by celiac patients is not appreciably less than normal. Stools may be frothy because little sugar is needed to produce a large amount of gas.

Cereal grains, particularly wheat, should be used with caution. Celiac patients absorb as much as 85 per cent of ingested starch. Relapses that occur after cereal protein is added to the diet may be caused by a coincident flare-up of infection. Celiac disease is rarely caused by sensitivity to wheat gluten. Sensitivity to other food proteins, such as potato, may occasionally be the etiologic agent.

Antibiotics should be administered prophylactically as well as therapeutically, since intercurrent infections cause most relapses.

Holt, L. Emmett: Celiac Disease—What is it?, J. Pediat. **46**:369-379 (March) 1955.

Osteoarthritis of Finger Joints

Enlargement of the finger joints without apparent cause is frequently noted among middle-aged women. At first only one joint swells. Eventually many or nearly all of the fingers are involved. The pain is slight and temporary even though the fingers are tender while the disease develops.

The idiopathic disease is differentiated from enlargement of a terminal finger joint after injury. Traumatic arthritis affects only one finger and is noted among men of all ages.

Idiopathic Heberden's nodes depend upon a single autosomal gene that is dominant in females and recessive in males. The climacteric is an important contributory factor. Probably the menopause and the nodes have etiologic agents in common.

The disease is not part of a generalized osteoarthritic syndrome. Nor is it related to hypertension or obesity. The nodes do not develop if the nerve supply to the fingers or hands is impaired. Patients with (1) peripheral nerve damage, (2) spinal cord disease, or (3) palsies of cerebral origin do not have the lesions.

Incidences in right and left hands are about equal. In the order of decreasing frequency, nodes affect the terminal joints of the index, middle, little, and ring fingers. In one-fourth of instances proximal joint swelling is noted. The distal joint of the thumb is involved as often as other proximal joints.

An enlargement consists of a palpable bony ridge or occasionally of two small nodules across the palmar and dorsal surface of the joint. A flexion deformity and lateral deviation of the distal phalanx eventually ensue.

Lateral radiograms of the terminal joints reveal bony changes in the form of spurs arising from both dorsal and palmar surfaces of the proximal, distal, and distal middle phalanges. The joint spaces are often uneven and the surfaces are unequal and rough. Demineralization does not occur and the joint surfaces usually show increased mineralization.

Posteroanterior and lateral radiograms of the proximal joints reveal broadening in both diameters of the proximal end of the middle phalanx without spur formation. Bone may project, however, if the distal end of the proximal phalanx is affected. The joint spaces are greatly decreased and the bone shows condensation rather than rarefaction.

When a node is caused by trauma, radiographic examination shows severe enlargement in a dorsal spur from the proximal end of the distal phalanx. The tip of the spur is broad and rounded and the joint space is usually unaltered.

(Continued on page 516)

Slightly Controversial

"From the meanest person, in some way or other, the learned man may learn something."—Aubray (circa 1620)

Some time ago, we advanced the theory that cavity preparation should NOT include undercuts. This was and still is a highly controversial subject.

Our premise was threefold. First, undercuts cut off all supply of pulp nourishment to the dentinal tubules above the undercut, thus having the effect of devitalizing that section of the tooth. Second, it recognized the adhesive qualities of the filling material, a claim disputed by the A.D.A. research commission. Thirdly, on sound physical-mechanical grounds, conventional cavity preparation does not require undercuts if the filling does not shrink; undercuts undermine and weaken the tooth.

We have always recommended sound cavity preparation in our literature and lectures. Since 1953 we have had fillings in our own mouths, and in patient's mouths using this principle and there seems to be no reason to retract. These PEARLon and P.F. fillings are definitely holding up.

This brings us to three subjects, *Adhesion*, *Formulas* and *Technic*.

Adhesion: Authorities say (with reason) that although P.F. and PEARLon are initially adhesive, (admitted) as soon as the dentine becomes wet from pulpal fluids the adhesion ends. This is probably so. But we maintain that this initial adhesion is a tremendous advantage in attaining microscopic attachment to the cavity walls, that this attachment is maintained due to the expansion of the filling during set, and that thereafter, if adhesion is lost, it is of no importance. By contrast, an ordinary acrylic filling has no adhesion to start with, it shrinks during setting, and unless deep undercuts are resorted to, it will fall out.

***Formulas:* P. F. and PEARLon are not "acrylic" filling materials. They contain methyl-methacrylate monomer the same as acrylics. But the powder contains "molectite", a filler of one of the hardest materials known. It also contains an adhesive, which bonds the entire mass together. This is the same adhesive which we supply to one of the largest plane manufacturers in the world. It was selected over all others to withstand actual flight conditions—*outside the plane*.**

Technic: P.F. and PEARLon have been subjected to A.D.A. tests and A.S.T.M. tests. They have always exceeded the tests. But we admit some reported mouth failures. Why? All of our tests were made on specimens using 3 parts powder to 1 part liquid. (Test specimens are larger than fillings.) Recently we made test specimens using the brush method. By actual measurement, we found that the brush method uses 3 parts powder to 9 parts liquid. No wonder many fillings have failed as did the test specimens. Further investigation revealed that the brush method not only used excess liquid but that every application was inconsistent.

The above facts adequately and substantially explain the variation of results attained by the dentist in the use of P.F. and PEARLon.

The Five-One Technic: Further tests show that PEARLon and P.F. use 5 parts powder to 1 part liquid. *The built in properties of these materials are incorporated in the POWDER and must not be dissipated by excess liquid.* The proper proportions are ½ cc of powder to 1/10 cc of liquid. Use 8 drops of monomer in a dappen dish, incorporate as much powder as it will absorb—plus. This gives you a 5 to 1 mix. Wet the cavity with liquid, then pack the same as silicate. This should give you the most permanent filling attainable. A paper on the subject, including complete technic, is available.

It took an engineer and dental technician to give us this lead.

American Consolidated Manufacturing Co.
835 N. 19th St.
Philadelphia 30, Pa.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS, OF AUGUST 24, 1912.

Of Dental Digest, published monthly at Pittsburgh, Pa., for October 1, 1956.
State of Pennsylvania,
County of Allegheny,

ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared R. C. Ketterer, who, having been duly sworn according to law, deposes and says that he is the Vice President of the Dental Digest, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse side of this form, to wit:

1. That the name and addresses of the publisher and editor, are: Editor, E. J. Ryan, B.S., D.D.S., 708 Church Street, Evanston, Ill.; Publisher, M. B. Massol, 1005 Liberty Ave., Pittsburgh, Pa.; Managing Editor: None; Business Manager, R. C. Ketterer, 1005 Liberty Ave., Pittsburgh, Pa.

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4. That the two paragraphs above giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no record to believe that any other person, association, or corporation has any interest direct or indirect in the said stocks, bonds or other securities than as so stated by him.

(Signed) R. C. KETTERER,
Vice President

Sworn to and subscribed before me this 2nd day of October, 1956.

(Seal) N. M. Gaertner, Notary Public.

(*Continued from page 512*)

Idiopathic Heberden's nodes cannot be prevented. Pain caused by the nodes may be reduced by aspirin. The patient should be assured that the disease is not crippling.

Stecher, Robert M.: Heberden's Nodes. A Clinical Description of Osteoarthritis of the Finger Joints, Ann. Rheumat. Dis. **14**:1-10 (January) 1955.

Rheumatic Fever—Prevention

Relapse is always possible with new streptococcal infection when rheumatic fever has been completely quiescent for two months. Continuous prophylaxis decreases the recurrence rate by 90 per cent.

All children and adolescents who have had rheumatic fever and adults who have had attacks within five years should receive prophylactic treatment with antibiotics. Persons with definite rheumatic heart disease should also be treated regardless of the interval since the last known attack. As soon as rheumatic fever is diagnosed, prophylaxis with penicillin sufficient to eliminate group A streptococci should be started. Therapy is continued at least five years after an attack.

The most commonly employed agents are the sulfonamides, oral penicillin, and repository penicillin. Daily oral doses of the sulfonamides reduce the incidence of recurrence by 85 per cent. Usually sulfadiazine is used. It is inexpensive and easy to administer. The recommended dosage is 1 gram once daily. However, patients may fail to take the medication consistently. In addition, the action is bacteriostatic rather than bactericidal and may give rise to toxic reactions such as agranulocytosis and exfoliative dermatitis.

Oral penicillin is more effective against group A streptococci than the sulfonamides. Also it eradicates the streptococcal carrier state. However, the cost is greater and the agent may be irregularly absorbed from the gastrointestinal tract. The recom-

CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 510 *and* 511)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor
DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

_____

Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

$10 will be paid on publication for each suggestion that is used.

mended dosage is at least 200,000 to 250,000 units once or twice daily. Reactions are rare.

Benzathine penicillin, a recently produced repository penicillin compound, is given in monthly injections of 1,200,000 units. Breaks in regimen are unlikely. The agent is highly effective. Hypersensitivity reactions are no more severe or frequent than with the parenteral use of other forms of penicillin.

An initial attack of rheumatic fever may be prevented by prompt and adequate penicillin treatment of streptococcal pharyngitis. Group A streptococci must be completely eradicated from the nose and and throat. To achieve this, effective blood concentrations of penicillin must be maintained for a ten-day period. Best results are obtained when treatment is initiated within two days of the onset of sore throat. A prophylactic effect may be possible even nine days after onset of symptoms.

Stollerman, Gene H.: The Prevention of Rheumatic Fever by the Use of Antibiotics, Bul. New York Acad. Med. **31**:165-180 (March) 1955.

Gastric Anacidity

In the fifth decade of life gastric anacidity is frequently noted. Invariably it occurs with pernicious anemia. Often it is associated with gastritis, stomach carcinoma, and gastric polyps.

The symptoms associated with achlorhydria are infrequent, nonspecific and apart from a low frequency of heartburn, are similar to the functional complaints of high, low, or normal gastric acidity. The condition is more frequently noted in men.

Although lacking in uniformity or specificity, gastrointestinal complaints have a chronic, functional, and occasional bizarre pattern. Frequently the onset or exacerbation occurs after emotional stress. Unexplained remissions are common.

The usual complaint is epigastric distress during or shortly after meals. A feeling of fullness, distention, or

burning discomfort is characteristic as is erupting belching after meals which often provides temporary relief. Pain may be ulcerlike, epigastric, or simulate biliary colic.

Most patients cannot tolerate spiced or fried foods. Some patients are unable to eat a specific food. Trouble most often comes from fats, milk, sweets, or meat. Occasionally nausea, burning tongue, metallic taste, furred tongue, bad breath, and vomiting occur.

Often constipation is an associated symptom. Diarrhea with or without lower abdominal distress is less frequent. Anorexia and weight loss may be severe enough to suggest abdominal cancer.

Serial roentgenograms reveal normal gastric and intestinal motility even in patients with constipation or diarrhea. Anemia is uncommon. Gastroscopic examination may show generalized or patchy mucosal atrophy, chronic superficial or hypertrophic gastritis, or normal mucosa. Polyps are rare.

It appears that addition of acid to a regimen of bland diet, sedation, and colonic evacuation are of doubtful value. A bland, low-residue diet with ample vitamins may provide temporary symptomatic benefit. However, prolonged symptomatic benefit is unusual.

Rappaport, Emanuel M.: Achlorhydria, New England J. Med. **252**:802-805 (March) 1955.

Fluorine and Dental Caries

IN DISCUSSING certain biochemical aspects of fluorine in water and certain articles of diet, Amies and Pincus[1] direct attention to the influence of the drinking of tea on the intake of fluorine in Australia and New Zealand. As an example, they cite Dunedin, New Zealand, where the municipal water supply contains 0.05 ppm of fluorine. From ordinary infusions of tea (without milk) made with this water, it was calculated that tea could contribute from 0.45 to 0.93 milligram of fluorine per day when the tea ration allowance was 8.1 grams per day. This would indicate that the average person can obtain approximately 1 milligram of fluorine per day from tea. This amount has been suggested as the optimal intake of fluorine for preventive effects. A person who is a heavy consumer of tea without milk, therefore, cannot afford to take in more fluorine than that already provided by tea, without exceeding the suggested optimum.

Current investigations in the United States have demonstrated a temporary partial control of dental caries in young children by the artificial fluoridation of municipal water supplies. Nothing more can be claimed at present. Adequate dental treatment and oral hygiene continue to be essential. Investigations in England in areas in which fluorides occur naturally in water revealed that the caries incidence in 12-year-old children who consumed such drinking water was less than that in control groups; but a survey of 15-year-old children indicated an equal incidence of caries in both groups. This merely demonstrated a three-year lag. It is also pointed out that fluorine is a powerful inhibitor of enzymes and a bactericidal agent for some bacteria. The actual chemical form in which sodium fluoride exists after addition to municipal water supplies has not been determined; its physiologic ability to be assimilated may be of a different order than that of fluorine occurring naturally in water. The cumulative storage of fluorine in the skeleton and the serious effects of toxic fluorosis have been noted in recent years. The difficulty of statistically assessing the incidence of caries in young children is discussed.

From Medical Literature Abstracts, *Journal of the American Medical Association* **153**:1323 (Dec. 5) 1953.

[1]Amies, A. B. P., and Pincus, P.: Fluorine and Dental Caries, *M. J. Australia, Sydney* **2**:41-80 (July 11) 1953.

Contra-Angles

"Is Mental Illness Mental?"

The title for this article is lifted bodily but with proper quotes from a paper that appeared in *The Journal of Psychology*.

Some time or other in a moment of passing introspection or of more sustained thought every person has wondered exactly what the mind is and how it operates. What goes on inside our bodies that gives us the power to perceive, to think, to feel? Why are some persons more generously endowed with these gifts? Is there something particular in the structure of the brain or in the neurohumoral systems that accounts for our differences in personality, skills, or talents? The mystery of the mental life has not yet been solved by either the saints, the philosophers, or the scientists.

In these days of increasing incidence of mental disease, when hospital beds are heavily filled with persons suffering from the entire spectrum of diseases from psychosomatic complaints to complete insanity, we should give respectful attention to *any* theory of causation.

A plausible theory is stated in the paper from *The Journal of Psychoogy* ("Is Mental Illness Mental?"). It is this: "psychological stress causes nutritional displacement, and nutritional displacement causes mental illness."

A condensed and digest version of this hypothesis of mental disease reads:

"In contrast to psychogenic theories of mental illness such as psychoanalysis, which treat the mind as a practically independent entity, there is a growing amount of experimental evidence which indicates the possibility that some of the psychoneuroses and the functional psychoses are in

part biochemical disorders of the body, and not illnesses of the mind as such. The present article presents a review of some of this experimental evidence, together with a discussion of some of its implications for theoretical psychology.

"It is known that states which are psychologically diagnosed as psychoneuroses and functional psychoses can be induced physically, as in the cases of specific avitaminoses and experimental starvation. The following are examples of the range of mental disorders induced by insufficient intakes of specific vitamins: lack of thiamine results in ideas of persecution, mental confusion, and loss of memory; lack of riboflavin causes depression, visual disturbances, disorderly thinking, inability to concentrate or perform mental work, and forgetfulness; lack of niacin causes psychasthenia, depression, anxiety, irritability, loss of memory, mania, hallucinations, and dementia; lack of pyridoxine causes epileptiform convulsions, general irritability and weakness; in addition, the lack of cyanocobalamin, biotin, and ascorbic acid are reported to cause similar types of mental disorders . . .

"Two distinct problems are recognizable here: (a) what are the *origins* of functional mental illness, and (b) what are *therapies* for functional mental illness. It is the first of these two questions that is the principal concern of this discussion. It is obvious that prolonged nutritional stress might be a causal factor in psychoneurosis and functional psychosis, but at the same time, nutritional therapy might be ineffective in relieving such illness, due, for example, to degenerative changes in the enzyme and coenzyme systems resulting from such prolonged nutritional inadequacies. At the same time, however, where nutritional therapy can relieve functional mental illness, this fact is partial confirmation of the hypothesis that such illness is in part caused by nutritional stress . . .

"It is generally recognized that one of the principal reasons why most types of such illness are considered to be functional, or purely psychological in origin, is that no physical pathology has to date been shown to cause these disorders. In view of our rather large knowledge of the roles specific vitamins play in a wide variety of mental illness, and in view of the demonstrated deterioration of personality in general starvation, the possibility is raised that some psychologically diagnosed psychoneuroses and functional psychoses are in part due to subclinical avitaminosis as well as perhaps to other types of subclinical malnutrition. Since there is presently no method of diagnosing such subclinical nutritional deficiences, the customary report of 'no physical pathology' in cases of functional mental illness is not completely valid . . .

"The foregoing considerations return us to the long-discussed problem of why only some of us become emotionally disturbed, if functional mental illness is due principally to unconscious conflict: for all of us, according to psychoanalytic theory, have just about the same burden of unconscious conflict. We all repress infantile sex impulses as well as mature sex impulses; we all repress hostility, and learn to live with frustration. The very foundation of social living is the inhibition of unrewarded responses. If this were the only cause of mental illness, then we would all be sick . . .

"On the hypothesis that nutritional stress plays a part in the origin of functional mental illness, the psychological past has a new significance. What the past apparently means is this: If a subject is primarily concerned with past events, perseverating on 'what happened' to him, this is evidence that he is to some degree emo-

tionally disturbed and nutritionally displaced. A person who is emotionally 'healthy' is one who is not concerned with the traumas and conflicts of the past, but is one who looks ahead with optimism and confidence. In order to do this, however, he must be restored by adequate rest and nutrition each day from the physical and psychological stresses of the previous day.

"Experimental evidence indicates that some functional mental illness may be a biochemical disorder of the body, and not a disorder of the mind as such. Both psychoneuroses and functional psychoses can be caused and relieved by nutritional means. This is a fact that is not compatible with current psychological theories such as psychoanalysis, which hold that all functional mental illness is purely psychological in origin, having no physical pathology.

"Since it is possible to relieve symptoms of psychological disturbance solely by nutritional replacement therapy, the question occurs whether at least some of the success attributed to psychotherapy for mental illness is not based in part upon a mistaken interpretation of the role psychological treatment plays in helping emotional symptoms. If it is true that subclinical nutritional deficiencies are involved in the origin of some functional mental illness, psychological treatment could have no direct value in such cases. However, supportive psychotherapy might be of indirect aid in the process of nutritional replacement, if it is instrumental in relieving psychological pressures which are a drain upon the physical resources of the body. However, some types of psychological treatment, such as psychoanalysis, possibly may provide more stress than support, and may consequently make an emotionally ill person more ill. Since it is true that some mentally ill persons become worse under psychoanalytic treatment, part of the reason for this may be explained by the hypothesis under discussion.

"The available data on the relation of subclinical nutritional factors to emotional disturbance appears to support the view that *psychological stress causes nutritional displacement, and nutritional displacement causes mental illness.* In addition to psychological stress, however, many other types of causal factors may also cause nutritional displacement, such as poor dietary habits, overwork, illness, poor digestion. The inappropriateness of psychotherapy as a remedy for nutritional stress due to such factors as childbirth, poor diet, or indigestion, is obvious.

"Finally, on the hypothesis that some functional mental illness is in part due to nutritional displacement, knowledge of the precise psychological traumas and conflicts of the past is of no particular interest, since it cannot tell us what is needed for physical rehabilitation.

"Experimental psychoneurosis can be induced in mentally normal subjects entirely by nutritional means. This fact raises the possibility that some persons suffering from functional mental illness may be the victims of subclinical nutritional deficiencies, rather than of unconscious conflict

which is purely psychological in origin. Experimental tests of this hypothesis with psychologically diagnosed mentally ill subjects resulted in statistically significant improvements. Persons who exhibited evidences of severe psychological conflict were brought into 'psychological adjustment' without recourse to psychotherapy. The evidence reviewed tends to confirm the hypothesis that some types of mental illness, which have hitherto been considered to be purely 'functional' in origin, have a physical basis of a biochemical nature, and consequently are not directly due to psychological trauma or conflict."

We have often said in this column and in other places that dentists encounter many distressed and anxious people. The *dental* conditions from which some of them suffer may have a psychosomatic background. Anything that will change the amount, the quality, or the chemistry of the saliva must be considered in the etiology of caries. Anything that will alter the quantity or the chemistry of the blood supply to the tissues of the mouth must be considered in the etiology of periodontal disease. Any vector that sets off strains and tensions in the muscles of mastication may incite conditions that produce, aggravate, or simulate forms of dental disease. More than ten years ago I expressed this point of view in a book. The years have added substance to this conviction.

— E. J. R.

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